EUROPEAN MULTIVENDOR MAINTENANCE MARKET

1992 - 1997

INPUT

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Abstract

This research study provides an analysis of the European market for multivendor maintenance. Contained within the report is a five-year market forecast for the whole of Europe, covering the period 1992 to 1997.

The study identifies and analyses the factors that are influencing the market and its growth, together with the challenges facing all types of vendors. In addition, progress in the developing areas of opportunity for multivendor maintenance is discussed and quantified.

Contained within the study are market forecasts for the individual country markets in Europe: France, Germany, the United Kingdom, Italy, Sweden, Denmark, Norway, Finland, the Netherlands, Belgium, Spain, Switzerland, Austria, Ireland, Portugal, Greece and Eastern Europe (the latter is considered a single group). Leading vendors and their estimated revenues in each country market are listed.

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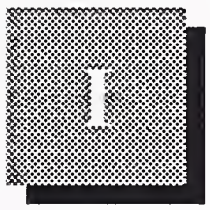


Introduction

This report has been produced by INPUT as part of the 1992 Customer Services Programme—Europe.

A
Objectives

The primary objectives of this study are to analyse the market for multivendor maintenance in Europe (including the countries of Eastern Europe) and in doing so to identify the opportunities that vendors face in the market as open systems become more common. The study also focuses on the factors that will influence the future development of the independent maintenance market.

B
Scope

Individual market forecasts are provided for the 16 country markets in Western Europe and, for the first time, a forecast for the countries of Eastern Europe, which are regarded as a single group.

This study assesses the market for multivendor maintenance in Europe and relates to three discrete sectors of the market:

- Independent maintenance vendor activity
- Dealers and distributors, providing maintenance on systems and networks marketed or installed by themselves either as resellers of proprietary systems or as systems integrators using open systems platforms
- Equipment vendor multivendor maintenance

C
Methodology

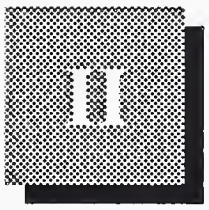
Field research for this study was conducted between April and June, 1992.

Vendor data were obtained during interviews with 10 independent maintenance companies and five equipment vendors. Data relating to additional vendors were obtained by requests to compile up-to-date profile information.

D
Report Structure

This report is organised as follows:

- Chapter II is an executive overview that presents a concise summary of the whole study.
- Chapter III provides a market forecast for the whole of Western Europe and for the seventeen country markets.
- Appendix A provides INPUT's set of defintions. This revised set of definitions is provided in its entirety in the first market report of the 1992 programme.
- Appendix B provides the economic assumptions used in making the market forecasts.
- Appendix C reconciles INPUT's 1991 and 1992 market forecasts for the European multivendor maintenance market.
- Appendix D contains the database of country market forecasts expressed in constant U.S. dollar terms.



Executive Overview

A

Open Systems Opens the Door

In its beginnings computer maintenance, like the maintenance of other types of electronic equipment, was the province of individual equipment vendors. Certain large users have always wanted to maintain their own equipment if they had the expertise in-house already; but most users, then and now, will automatically think of the supplier as the natural source of ongoing maintenance. Third-party maintainers (TPMs) were at the start, therefore, dependent on the manufacturers for the provision of parts, for documentation and for support for the trickier situations.

TPMs became an important part of the market, as a form of monopoly buster—breaking the manufacturers' monopoly on the aftercare market—first in the U.S., then in the U.K. and Europe. The history of independent maintenance to date is thus one of opening up previously closed markets. These markets were the markets for maintenance and aftercare for essentially proprietary user bases seen as separate market segments—IBM mainframe, Digital VAX, IBM midrange, etc. Only a few of the sectors were big enough to support a substantial number of independent maintainers.

This relatively simple picture did not last long in the volatile IT industry of today. The technological convergence of computers and telecommunications required systems to be interconnected. Hence arose the requirement for international standards for networking, interoperability and operating environments. The pursuit of standards has had both as an objective and as a consequence the trend for the whole IT market to migrate from being a series of closed "islands" of automation to being a "sea" of "openness" in which all systems can network and interwork equally well with each other.

At the same time, technology has had an even more revolutionary effect on the aftercare market. The increased reliability of electronic equipment brought about by continuing component miniaturisation and better manufacturing techniques threatens to destroy the aftercare market completely by reducing the need for equipment maintenance.

The question for all customer services vendors, whether they are equipment suppliers or independent maintenance organisations, is how to adopt a viable strategy in the face of these tremendous changes, the onset of which has been quickened and in some cases even triggered by the recessionary pressures present in today's increasingly global economy. INPUT's 1992 multivendor maintenance report is conceived with a view to assisting vendors in addressing these important issues. INPUT proposes a three-point programme for its clients, and is putting in place specific research to inform vendors' critical decisions.

The maintenance market is in transition from being a series of closed segments of equipment maintenance and repair towards becoming an ongoing aftercare market in which the segmentation will be more fluid and more dynamic. INPUT has redefined the market as one for multivendor maintenance in which a number of types of vendors will be in contention for market share:

- Independent maintainers
- Equipment manufacturers
- Dealers, distributors and VARs (value-added resellers)

New opportunities are arising as the market proceeds through this transition (which will not be complete within the forecast period of this report). Opportunities are strongest in areas associated with the major trends in the industry:

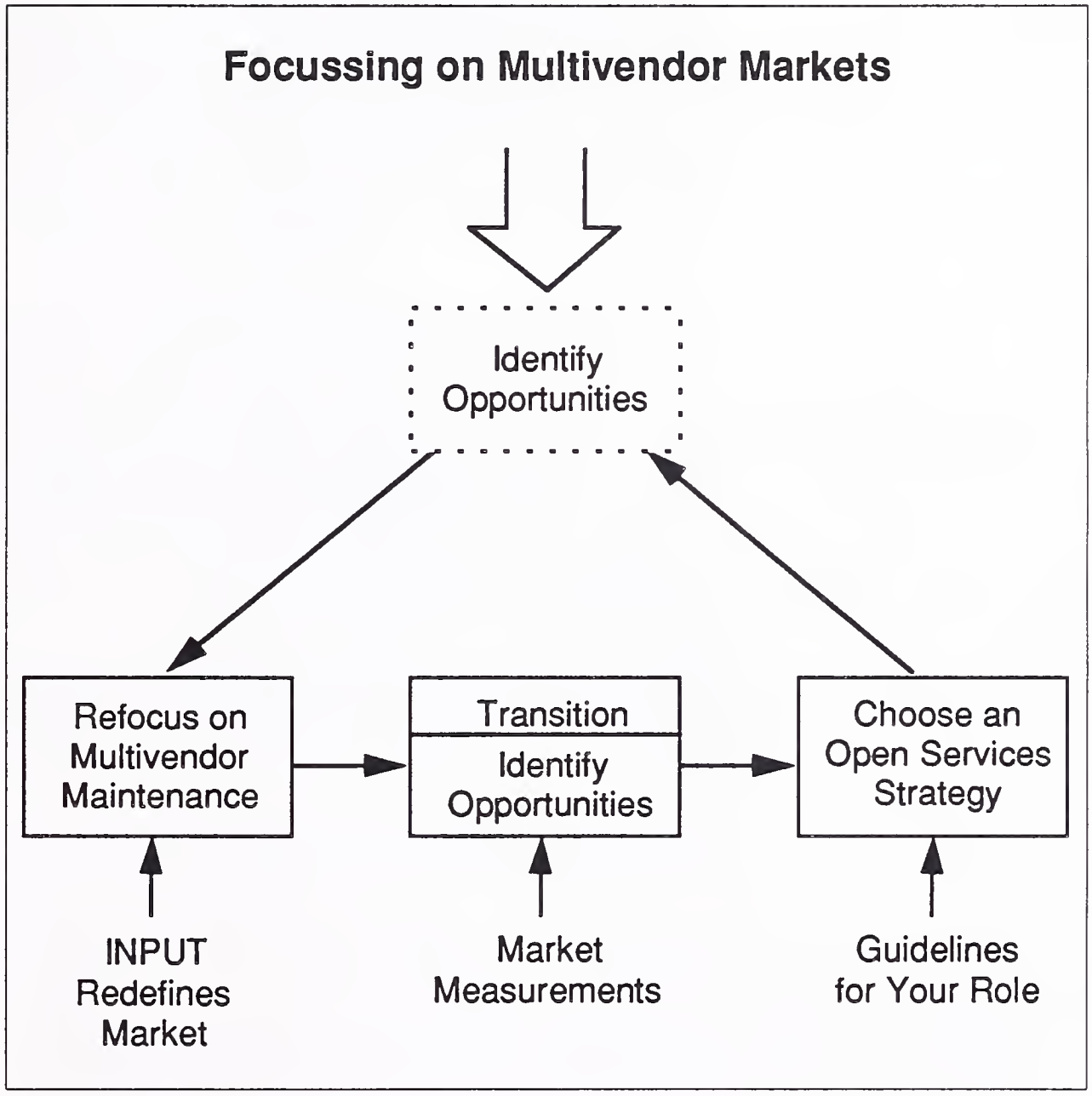
- Networking
- Downsizing
- Outsourcing

INPUT's reports are focussing on the segments that lie at the intersections of these forces; for example, the outsourcing of desktop services. Opting for these opportunity markets gives vendors increased short- and long-term viability in the face of the revolutionary forces currently at work.

Survival in the more competitive open markets that are being created depends upon vendors developing effective strategies that embody clear objectives for the future. INPUT offers both useful guidelines in its multiclient reports and in-depth research and consulting in its custom

studies. The current report aims to guide by highlighting the key trends and key measurements of the multivendor portion of the current customer services marketplace. Exhibit II-1 summarises the logic behind seeing the increasingly open market as offering the open door to new opportunities.

EXHIBIT II-1



B

Multivendor Maintenance Market Redefined

The original use of the term multivendor maintenance was to cover situations in which an equipment supplier was contracted to maintain other vendors' equipment on sites where it had supplied the main configurations. It represented the equipment suppliers' response to the encroachment of the independents, answering as it did the competitive weakness that manufacturers had in the face of the more flexible approach of their independent rivals who can offer maintenance on a range of kit. Some vendors only offer multivendor maintenance to their existing customer

base. IBM is an instance. Others propose their offerings to the wider market, and in so doing effectively set up an independent maintenance organisation within their own ranks. Olivetti is an example of this approach.

Although perhaps conceived as a move to counter the growth of the independents, this trend on the part of the equipment suppliers has the effect of also putting them more into competition with each other. It also implies that the 'ownership' of individual sites or customers is now by no means exclusive. Vendors say that as few as 30% of their sites can be considered "theirs," i.e., are essentially housing only equipment of their manufacture.

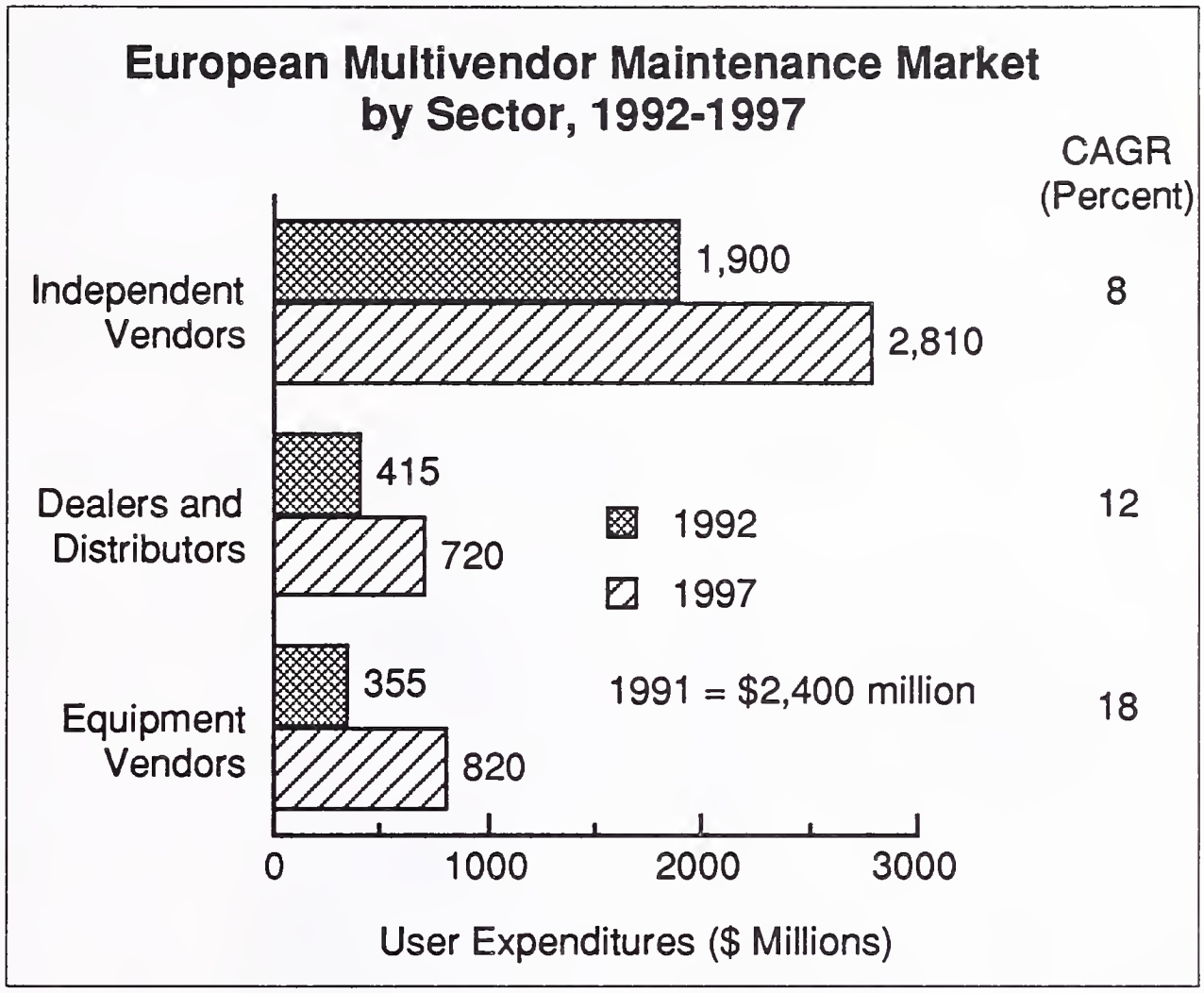
In this more complex situation, INPUT has redefined the multivendor maintenance market to include all maintenance expenditures in which the contract involves more than one supplier's equipment or in which the contract is with a vendor who offers cover on more than one supplier's equipment. This definition formalises the market position measured in INPUT's 1990 independent maintenance report, and allows INPUT to establish continuity between the market measurements made in last year's report and those in this report.

The important question for a maintenance vendor is: "Who are my true competitors?" Exhibit II-2 shows the multivendor market forecast for the whole of Europe, split out across the three most important groups:

- Independent maintenance vendors, who take the major share due to their essentially multivendor strategy
- Equipment and system vendors, who have the highest growth rate
- Dealers and distributors, who are becoming more involved in marketing and selling aftercare contracts, especially in the desktop services area

An even more important question is: "How should our service offerings evolve to maintain our market position in the emerging age of open systems?"

EXHIBIT II-2



C

Static European Maintenance Markets

Exhibit II-3 summarises the forecast for the overall European equipment maintenance market between 1992 and 1997. The chart shows a growth rate of under 1.5% per annum between these years and also records the actual decline to be experienced this year as recessionary pressures combine across a number of countries to produce the first actual downturn since INPUT began measuring the field service market.

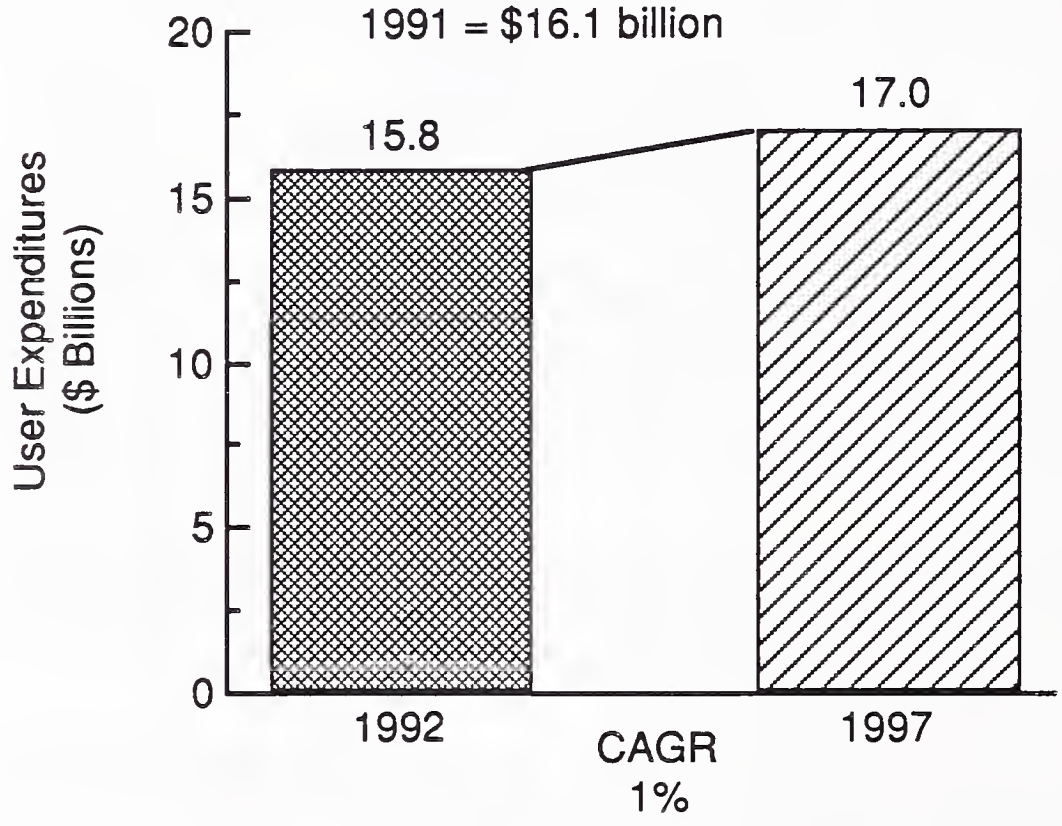
These forecasts have been based upon a four-sector model of the installed base in Europe. The key findings of running this model in mid-1992 are:

- Mainframe maintenance is shrinking across the five-year period as downsizing (and upsizing) becomes more prevalent.
- PC and low-end network maintenance is also shrinking as the in-built resilience afforded by having multiple units leads more and more users to dispense with the standard maintenance contract.

- Best opportunities lie in the midrange, workstation and server systems area, since it is these systems that are increasingly mission-critical as large organisations downsize onto distributed systems and smaller enterprises become more reliant on their core systems.

EXHIBIT II-3

European Customer Services Market
Hardware Maintenance Sector Growth, 1992-1997



D

Multivendor Maintenance Still Expanding

The multivendor maintenance market in Europe continued to grow during 1991 and is expected to have expanded by another 11% in 1992. Although the market is subjected to declining growth rates (it was not so long ago that INPUT was reporting annual growths of 16% and 15%), the forecast for the next five years is for a compound annual growth rate (CAGR) of 10%.

INPUT finds that in overall terms, growth will not return to its pre-1990 growth pattern because recessionary pressures have irreversibly quickened the fall in the growth rates that INPUT was anticipating in its previous independent maintenance market reports.

Exhibit II-4 summarises the forecasts by country for the major country markets of Europe. Including Eastern Europe in the forecasts and measurements—for the first time, this year—still allows the market sizing to be reconciled to the market reported in INPUT's 1991 report (see Appendix E).

EXHIBIT II-4

Multivendor Maintenance Market Forecast
Europe, 1992-1997

U.S. $ Millions					
Country Market	1991	1992	Growth 1991-1992 (Percent)	1997	CAGR 1992-1997 (Percent)
France	470	500	6	680	6
Germany	245	270	10	460	11
United Kingdom	770	830	8	1,200	8
Italy	210	240	13	390	10
Sweden	76	80	5	105	6
Netherlands	164	180	10	320	12
Belgium	70	90	15	145	12
Spain	150	190	27	505	22
Rest of Europe*	245	300	22	545	13
Total (Rounded)	2,400	2,670	11	4,350	10

* Includes Eastern Europe

The key features of the future markets in Europe are:

- Multivendor maintenance will remain a fragmented market and thus retain the characteristics of a set of national markets. Although large organisations will favour the placing of contracts with maintenance companies that can offer uniform service levels across the whole region, there will remain a strong potential for innovative maintenance/service vendors who can differentiate their lines of service by vertical sector within individual countries.

- The United Kingdom remains the largest country market, but has one of the lower growth rates. Germany will not reach its potential as a market due to the strength of the known German preference for hardware suppliers. Spain will become the number-three country—ahead of Germany by 1997—due to the considerable geographic extent of its land mass and to the timing of its economic expansion to coincide with the claiming of the age of open systems.

- Some countries in which the IBM installed base is very high, e.g., Italy and Switzerland, will struggle to meet their potential for multivendor maintenance because the proportion of proprietary systems will remain relatively high.

Exhibit II-5 lists INPUT top vendor rankings by 1991 revenues in Europe.

E

Desktop Services—A Major Opportunity

For customer services organisations, desktop services represents an important new market opportunity whose characteristics make it of potential interest to a range of market players:

- Systems vendors
- Independent maintainers
- Dealers and distributors
- Professional services companies

The key factor, giving it added interest for customer services, is that it offers a combination of traditional and new service elements:

- Traditional hardware maintenance and repair
- System software support
- Network implementation and upgrades
- In-house or off-site help desk facilities
- Applications software product supply and maintenance

EXHIBIT II-5

The Multivendor Maintenance Market
The Top 20 Vendors

Company	1991 Multivendor Sector Revenues ($ Millions)	Multivendor Sector Market Share (Percent)
Granada	257	10
Olivetti	229	9
Thomainfor	225	8
Digital	105	4
Sorbus	97	4
Getronics	96	4
Nexor/Telub	63	2
ACT	51	2
NCR	40	1
Computeraid	39	1
Eltec	36	1
Servicetec	35	1
TASQ	35	1
IBM	30	1
Hewlett-Packard	20	<1
Kalamazoo	19	<1
ITI	18	<1
Ciesse	17	<1
CSEE	17	<1
Sintec	17	<1
Others	1,224	46
Total	2,670	100

Downsizing of systems to the departmental level and the spread of PCs to the desktop are the principal drivers of the sector, aided by the user trend towards adopting an open systems IS strategy.

In its early pioneering phase, the desktop services sector is emerging as an opportunity for outsourcing among large and medium-sized organisations, where the number of existing desktop devices is large enough to require considerable IS management effort. This is an irritant to IS managers and directors who are more interested in systems activities at the corporate and business unit levels, which is where the main impact of downsizing is currently being felt.

Different vendors are taking different approaches, principally dictated by backgrounds. Typically this means that:

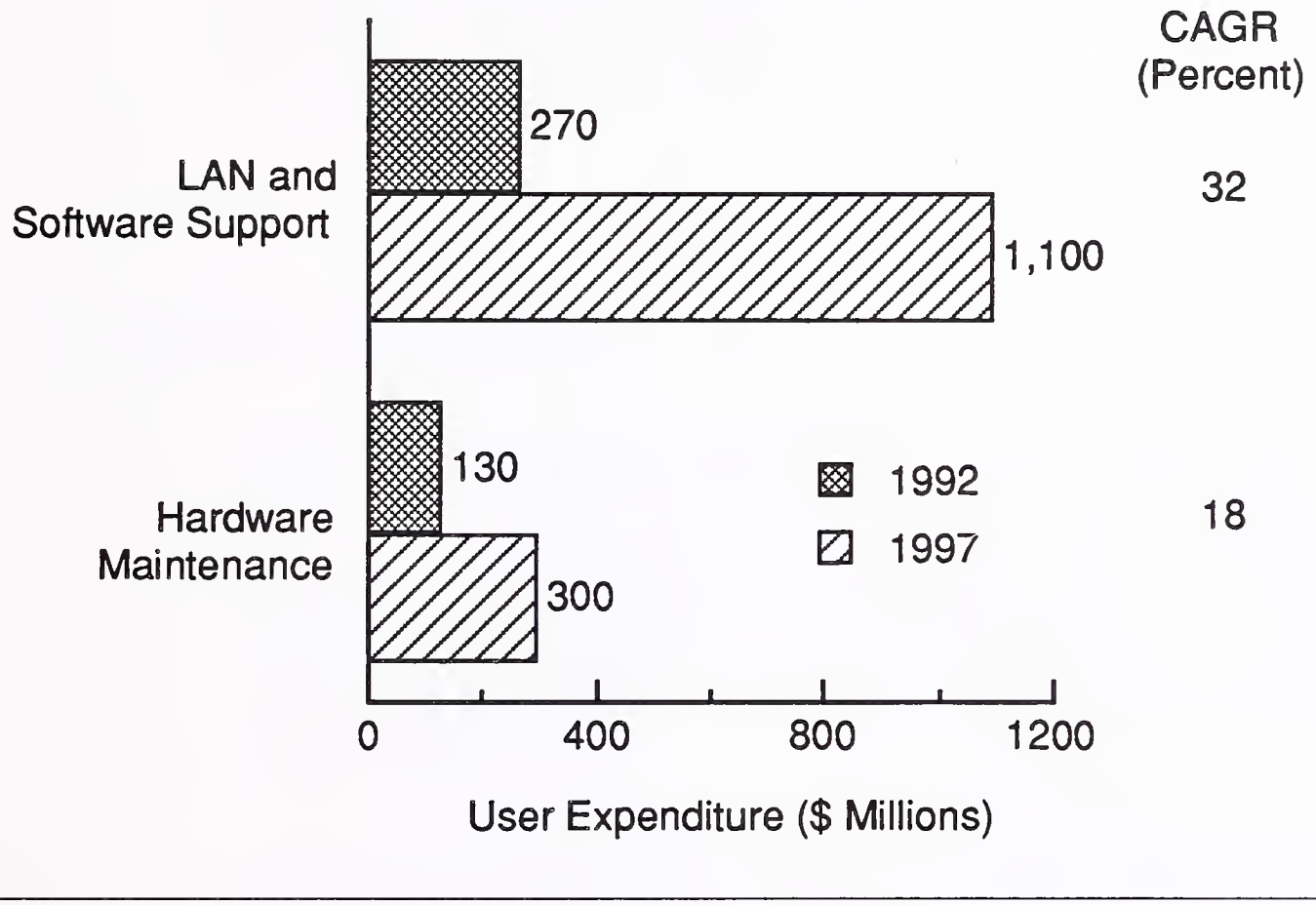
- The outsourcing option is attractive to vendors from the PC distributor and independent maintainer communities.
- A standalone set of services is the option chosen naturally by equipment vendors.
- Offering ad hoc services is the preferred approach among the professional services vendors.

Key to success in this sector is knowledge of standard software products for the desktop and their evaluation, integration and support. Finally, the ability to deliver service through a network opens up a range of possibilities not open to vendors who view their roles as more in the area of service delivery through personnel.

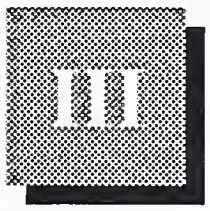
The market for these desktop services is forecast to reach $400 million in Europe in 1992, rising to $1,400 million in 1997 (see Exhibit II-6). The overall growth of 28% per annum (CAGR) is for the whole sector, including all services from device and network installation to support and maintenance, but excluding the equipment supply itself. This overall growth rate is lower than that for the component of non-maintenance services, which is set to grow at 32% p.a. over the same period. The non-maintenance component focusses on software product supply and support, as well as the activities of implementing, upgrading and supporting LANs. The maintenance portion of this market is set to grow at 18% per annum, a rate even higher than the overall multivendor maintenance growth rate.

EXHIBIT II-6

Desktop Services Market by Hardware and Software Categories—Europe, 1992-1997



The U.K. is the largest country market for desktop services at $175 million, followed by Germany and France with $66 million and $45 million, respectively. The fourth largest market is the Netherlands, with $30 million.



Multivendor Maintenance Market Analysis

A

Definition of Multivendor Maintenance

Multivendor maintenance became current in the customer services industry at the time the major system equipment vendors started to restructure their offerings to counter the threat posed by the independent maintenance companies. The term multivendor maintenance was coined to denote the fact that the equipment suppliers were willing to maintain equipment from platforms other than their own. This distinguished these new offerings from equipment suppliers' previous offerings, which were proprietary or single vendor.

Since this initial use of the word became current, the market has seen considerable changes in all sectors. Key long-term trends affecting the equipment maintenance market include:

- Open systems based on networking and a universal operating system, such as UNIX, have come to be accepted by the industry as the long-term direction it must take.

- Increased reliability of equipment has caused users' perceptions of the requirement for maintenance to weaken in terms of its criticality to a distributed application or to an individual desktop end user.

- Recession (which one INPUT respondent called the 'revealer') has sent shock waves through the whole of the industry, causing an acceleration of certain trends, such as the 'slimming down' of staff numbers and increasingly hard-nosed examination of IT and IS budgets.

The overall effect on equipment maintenance revenues has been to slow the growth in Europe to below inflation, so that in real terms the sector is truly in decline. This has increased the need for vendors to seek markets elsewhere, either adjacent markets such as environmental services or

professional services support, or to take market share from rivals. This has inevitably increased competition in the overall customer services market and blurred the distinction between independent maintenance, open systems maintenance and multivendor maintenance.

The challenge in monitoring and reporting on this market is to be able to provide information services that track new market opportunities, while at the same time maintaining continuity in our database, so that in year-to-year analyses, like can be compared to like.

To maintain continuity with INPUT's previous year's analyses and to create a framework for future markets studies in this area, INPUT has defined multivendor maintenance as all equipment maintenance revenues (either from ongoing contracts or earned through ad hoc repair transactions), whatever the type of supplier. Formally, multivendor maintenance is defined as: "Expenditures on maintenance by users for maintenance of systems and equipment which have been manufactured or supplied by one or more vendors besides the vendor from whom the maintenance is sourced."

Examples of contracts or pieces of repair work that would qualify as multivendor are:

- An independent maintainer is contracted to maintain all of a user's PCs and associated printers, which were sourced from a number of suppliers.

- A UNIX system supplier has been asked to maintain and support an open systems network consisting of server equipment and linked workstations, which it had previously installed.

- A PC/workstation distributor for Digital equipment, which has recently diversified into holding an IBM agency for midrange systems and workstations, installs a multi-user UNIX system that connects to existing equipment of a proprietary nature over a token ring local-area network (LAN). Having shown capability for integration across a number of platforms, the company is asked to provide maintenance of the newly installed and the existing portions of the whole network.

The important features of the market which justify a redefinition of the multivendor maintenance market to cover maintenance provided by equipment manufacturers, dealers and distributors, and independent maintainers, are:

- Open systems imply that all the skills needed to maintain them are less likely to reside completely within one organisation.

- Increased use of networking, both at local-area and wide-area levels, means that the boundaries which separate one system from another are less easily drawn in a logical manner. Hence the "proprietary territories" of the major equipment suppliers appear more easily prone to "invasion" from other suppliers.

- Users are nevertheless still looking for one supplier to take over the maintenance of as large a chunk of system as is feasible in any one instance. Hence there will be an ongoing need for the user to reduce the number of suppliers with whom it deals.

INPUT's 1991 report on the independent maintenance market in Western Europe dealt with all the types of maintenance described above, from the three types of vendor mentioned:

- Independent maintenance vendors
- Dealers and distributors
- Systems and equipment vendors

This 1992 report covers exactly the same market areas as the 1991 report—for the sake of continuity with the past—but has renamed the overall market sector the multivendor maintenance market, in order to provide continuity forward into the evolving future market for customer services based on a mixed installed base consisting of both proprietary and open, networked platforms.

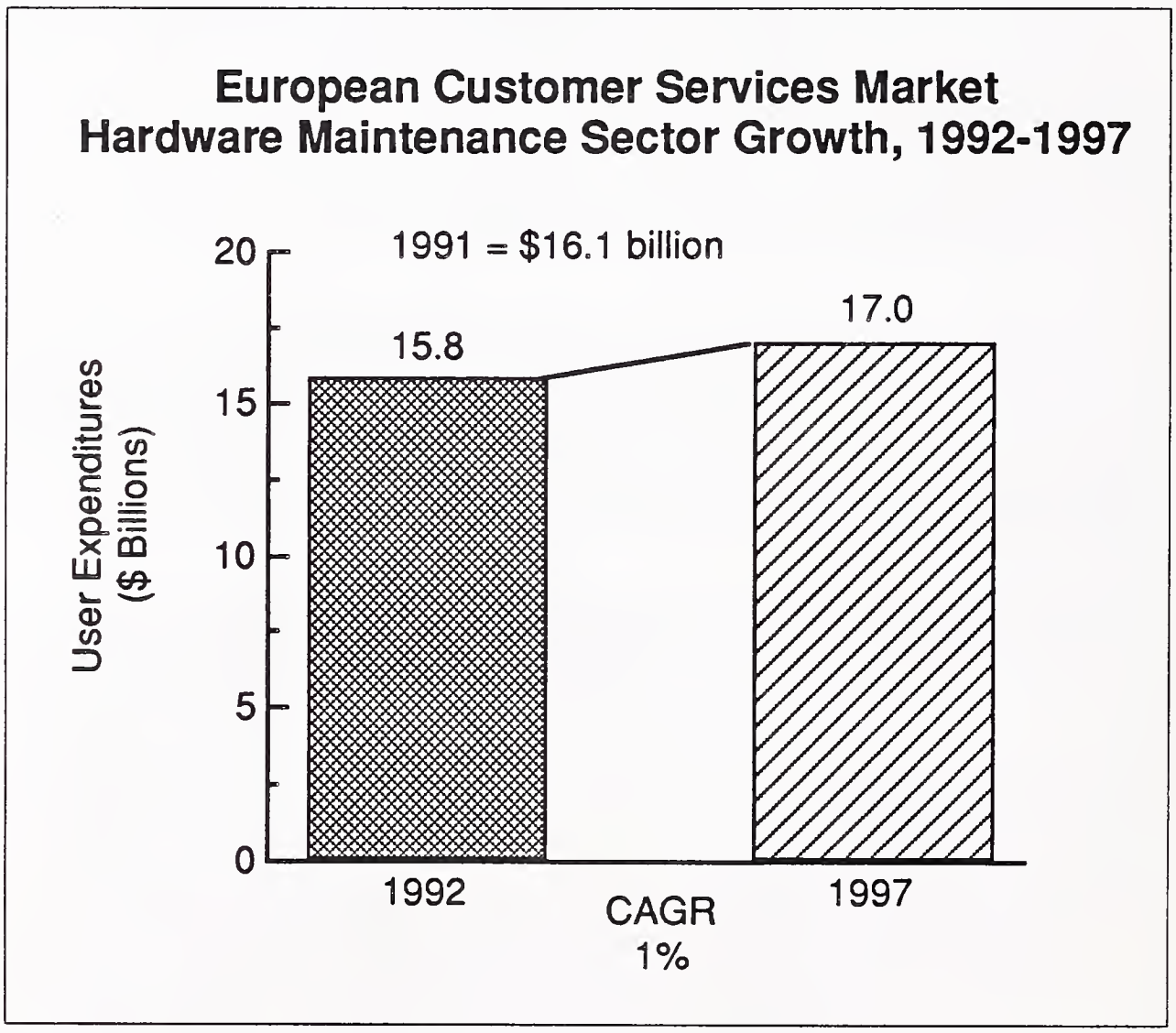
Professional services vendors are responsible for a very small percentage of the maintenance contracts currently placed. They are therefore bracketed with one of the other vendor groups at this time, i.e., dealers and distributors. Professional services vendors' influence will increase as the market matures and more outsourcing contracts that handle the maintenance of the equipment are placed in their hands. A recent example—with a nice touch of irony to it—is the placing of a network and data centre facilities management contract with Hoskyns Group (part of the French CAP Gemini Sogeti group) by Granada Group, the parent company of Granada Computer Services International (GCSI), Europe's leading independent maintenance vendor. GCSI is retaining the maintenance contract for the Granada Group's Bedford, U.K. network management centre, which will be run on a day-to-day basis by Hoskyns.

B

Total European Maintenance Market

INPUT revised its forecasts for the whole European equipment maintenance market during its 1992 research. These forecasts are based on a four-sector model of the installed base of systems across the combined markets of Western Europe and Eastern Europe (the latter is treated as one group of countries). The hardware maintenance sector is shown in Exhibit III-1, where the growth rate has been revised down to under 1.5% per annum CAGR over the forward five-year period.

EXHIBIT III-1



This levelling off of the maintenance sector is contributed to by a range of different growth rates as the countries in Europe mature in different ways. Smaller markets in the southern and eastern parts of the continent are still developing and growing at positive rates, whereas mature Northern European country markets have been gripped by recession and are experiencing negative or below-inflation-rate growth factors. In fact, the cumulative effect of recessionary pressures is such that the total market in 1992 is set to decline from $16.1 billion in 1991 to $15.8 billion this year.

By contrast, multivendor maintenance is increasing its share of the overall market fast enough to be experiencing positive growth rates in all countries, even though individual vendors have seen in some cases a decline in the maintenance portion of their revenues over the past year. Independent maintainers are diversifying their activities away from pure hardware maintenance or repair wherever possible. This means that contracts for total support may cover a combination of support for hardware, operating software and a network. In these cases of total system or solution support, INPUT has aggregated the user expenditures under the hardware maintenance category, and these expenditures are, therefore, counted in the multivendor maintenance market. Specific contacts awarded to multivendor maintenance vendors for services, such as network consulting and design, system software evaluation or system software support, are not counted in the market under review in this report, as they are non-maintenance revenues and are counted in other sectors of INPUT's services market model.

The increase in these multi-service, total support types of contracts is one of the main factors buoying up the overall multivendor maintenance market in the face of the competitive pressures on standard equipment maintenance. Since the independence maintainers and the other vendors of multivendor service offerings have a range of expertise that matches the requirements for open systems and desktop services more closely than it does those for proprietary systems, these vendors are increasing their multi-service contract penetration in these areas. The ratio of the multivendor sector to the whole maintenance market is therefore increasing and forecast to continue on this trend. Exhibit III-2 illustrates this point clearly; multivendor maintenance will be more than a quarter of all maintenance by 1997. Exhibit III-3 gives the overall forecast for Europe.

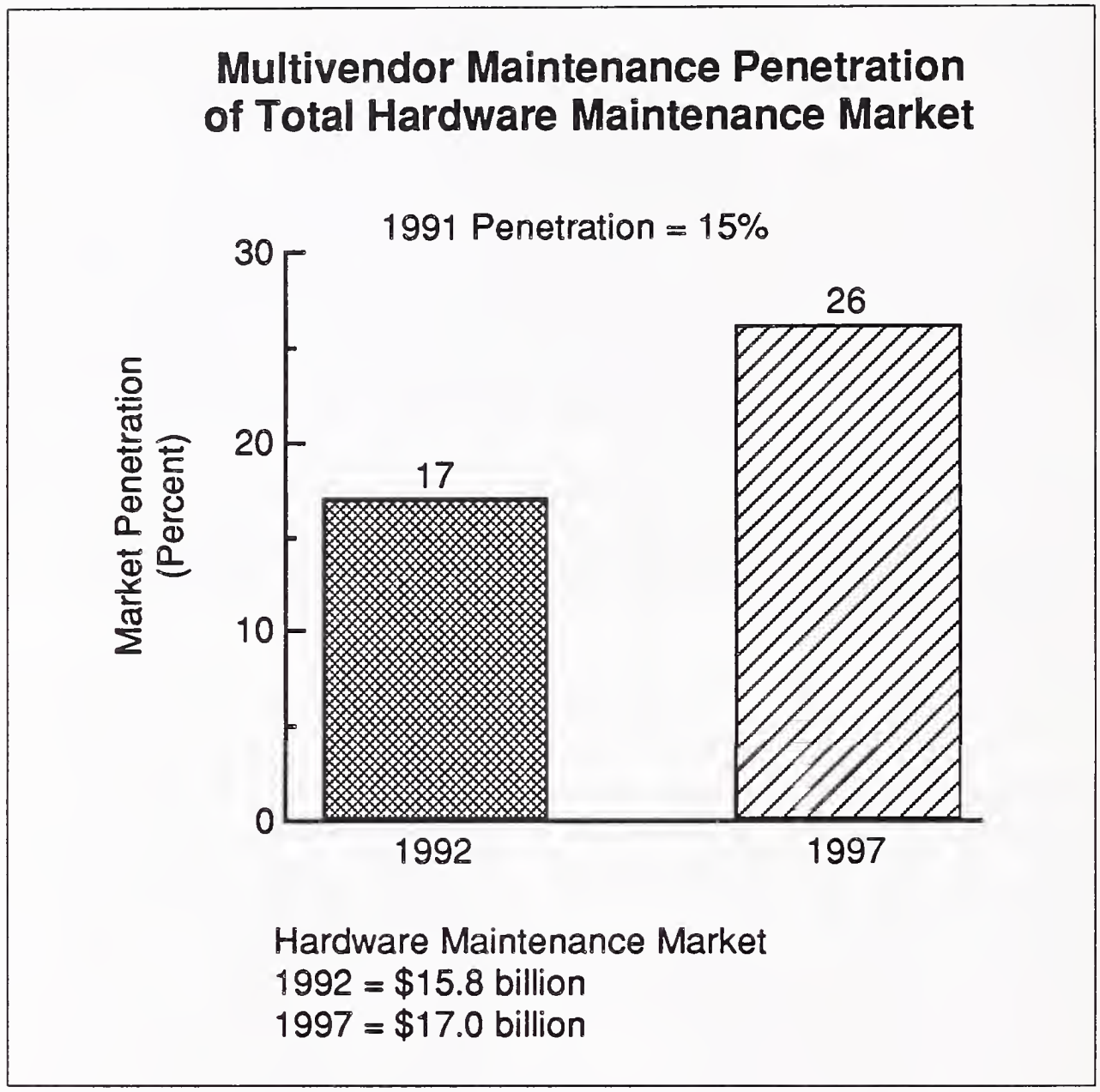
C

Multivendor Maintenance Forecast by Country

This section provides the detailed forecasts and market sizings for each of the 16 individual countries that INPUT tracks in Western Europe as well as the group forecast for the countries comprising Eastern Europe. The more important trading countries included in this group are:

- Baltic states (Estonia, Latvia, Lithuania)
- Czechoslovakia
- Hungary
- Poland
- Russian Federation
- Ukraine

EXHIBIT III-2



The market descriptions for each of the important multivendor country markets will be published by INPUT as a series of Research Bulletins during the course of the next few months. This section gives the current forecasts and growth rates for each of the sectors represented by the three groups of vendors:

- Independent maintenance organisations (IMOs)
- Dealers and distributors (professional services companies are included in this group)
- Equipment vendors

EXHIBIT III-3

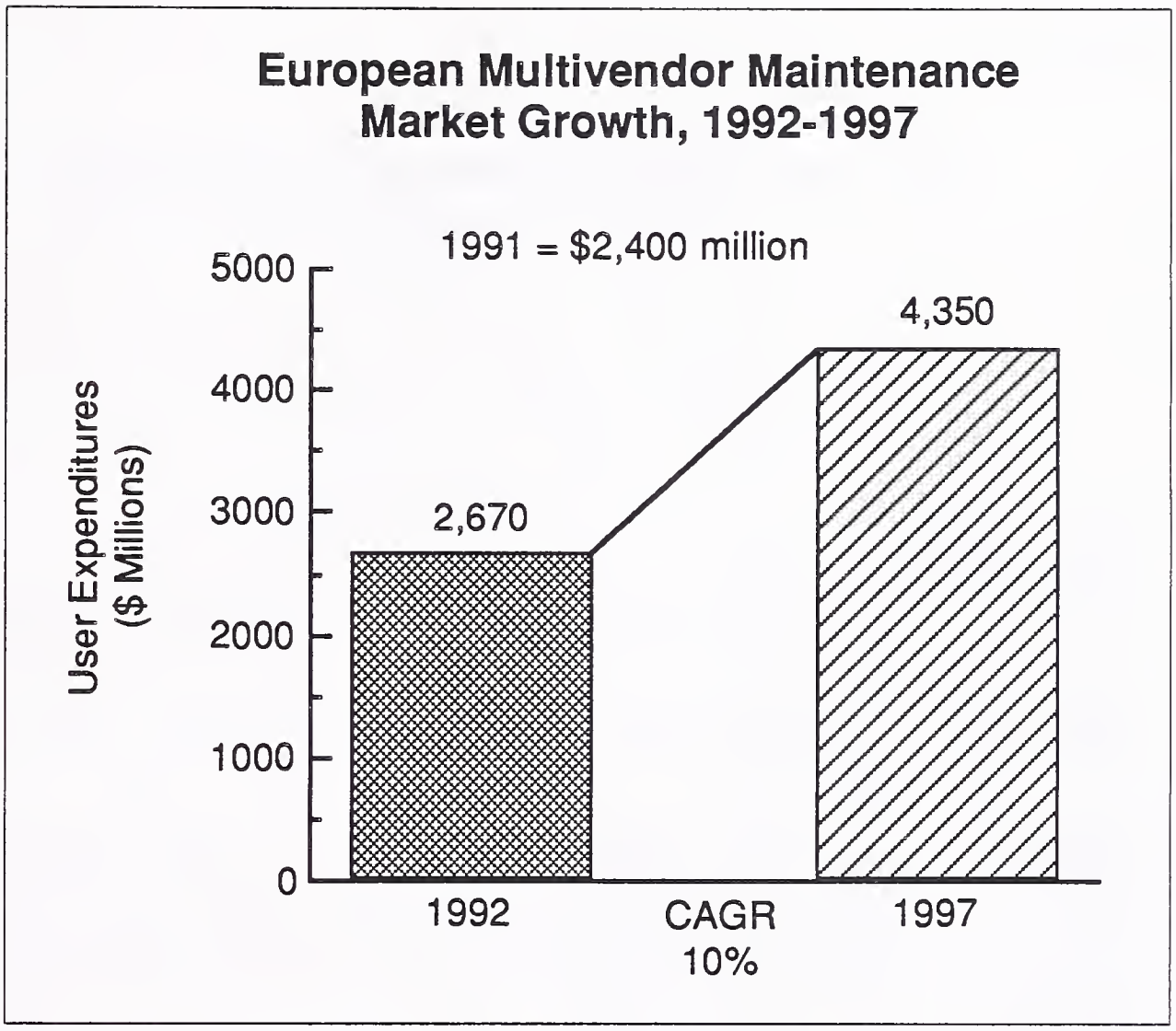


Exhibit III-4 shows the forecast for the total market by vendor type. IMOs remain holding the largest market share throughout the period but will have lost share, going from a 71% share in 1992 to a 65% share in 1997. This loss of share is due to:

- Increased market penetration by the equipment suppliers who will nevertheless be ready to outsource considerable amounts of maintenance and repair work to independent maintainers (acting as fourth-party maintenance suppliers)

- Increased willingness on the part of the equipment vendors to enter into arrangements with their distribution chains, whereby the dealer or distributor will be responsible for selling and managing the maintenance contract for vendor systems, while the equipment vendor takes responsibility for delivering the service as a subcontractor or agent

- Increased specialisation on the part of the independent vendors in order to concentrate on specific applications, industries or platforms

EXHIBIT III-4

Multivendor Maintenance Market Forecast—Europe

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	1,705	1,900	2,060	2,215	2,390	2,600	2,810	8
Dealers and Distributors	380	415	470	530	600	655	720	12
Equipment Vendors	315	355	410	485	560	685	820	18
Total	2,400	2,670	2,940	3,230	3,550	3,940	4,350	10
Annual Growth (%)		12	11	10	10	11	10	

Note: Numbers are rounded

Exhibit III-5 summarises the growth rates and market sizes for each of the individual countries as measured in dollar terms according to the currency conversion factors given in the list in Appendix B. These and all other forecasts in this report are calculated to include an allowance for inflation, using the assumptions about inflation rates in each country that also appear in Appendix B.

EXHIBIT III-5

Multivendor Maintenance Market Europe, 1992-1997 (U.S. Dollars)

$ Millions					
Country Market	1991	Growth 1991-1992 (Percent)	1992	1997	CAGR 1992-1997 (Percent)
France	470	6	500	680	6
Germany	245	10	270	460	11
United Kingdom	770	8	830	1,200	8
Italy	210	13	240	390	10
Sweden	76	5	80	105	6
Netherlands	164	10	180	320	12
Belgium	70	15	80	145	12
Spain	150	27	190	505	22
Denmark	20	10	22	35	10
Norway	23	13	26	43	10
Finland	21	9	23	34	8
Austria	20	19	24	44	13
Switzerland	50	10	55	81	8
Portugal	6	24	8	22	23
Greece	7	17	8	20	19
Ireland	8	10	8	14	10
Eastern Europe*	90	33	120	250	16
Total (Rounded)	2,400	11	2,670	4,350	10

* Includes: Commonwealth of Independent States countries (in Europe), Czechoslovakia, Hungary, Poland, etc.

Exhibits III-6 to III-36 are a set of pairs of tables showing, for each country:

- In the first chart, the market size and forecasts for the country
- In the second, the leading independent vendors in the country with published or estimated maintenance revenues

In certain of the smaller countries, INPUT has not been able to identify any significant independent suppliers, and in these cases the second table is omitted. In some countries in which there are few independent suppliers of significance, INPUT has included some of the leading equipment suppliers operating in the multivendor sector.

EXHIBIT III-6

Multivendor Maintenance Market Forecast—France

FF Millions

	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	2,080	2,230	2,360	2,490	2,610	2,720	2,770	4
Dealers and Distributors	220	210	260	290	320	350	380	13
Equipment Vendors	130	150	180	220	270	320	380	20
Total	2,430	2,590	2,800	3,000	3,200	3,390	3,530	6
Annual Growth (%)		6	8	7	6	5	4	

Note: Numbers are rounded

EXHIBIT III-7

Leading Independent Vendors in France Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	FF Millions	
Thomainfor	1,036	1,050
TASQ	180	200
Granada	145	150
Sorbus	93	140
ITI	70	80

EXHIBIT III-8

Multivendor Maintenance Market Forecast—Germany

DM Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	205	218	236	253	287	320	360	11
Dealers and Distributors	160	180	200	230	250	270	300	11
Equipment Vendors	10	12	14	17	23	35	50	33
Total	375	410	450	500	560	625	700	11
Annual Growth (%)		10	10	11	12	12	12	

Note: Numbers are rounded

EXHIBIT III-9

Leading Independent Vendors in Germany Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	DM Millions	
Sorbus	35	38
Granada	32	30
Thomainfor	18	20
Telub Bitronic	14	16
Areatech	12	15
Multitech	8	10

EXHIBIT III-10

Multivendor Maintenance Market Forecast—United Kingdom

£ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	310	337	355	367	383	415	445	6
Dealers and Distributors	25	28	30	33	37	40	44	10
Equipment Vendors	75	80	90	100	110	124	140	11
Total	410	445	475	500	530	580	640	7
Annual Growth (%)		9	7	6	6	8	9	

Note: Numbers are rounded

EXHIBIT III-11

Leading Independent Vendors in the United Kingdom Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	£ Millions	
Granada	110	120
ACT	27	30
Computeraid	20	24
Sorbus	19	20
Servicetec	15	16

EXHIBIT III-12

Multivendor Maintenance Market Forecast—Italy

Lira Billions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	165	185	200	213	222	235	250	6
Dealers and Distributors	65	75	90	105	120	130	140	13
Equipment Vendors	10	12	15	22	30	45	60	38
Total	240	272	305	340	372	410	450	11
Annual Growth (%)		13	12	11	10	10	10	

EXHIBIT III-13

Leading Independent Vendors in Italy Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	Lira Billions	
Ibimaint	58	60
Ciesse	20	22
Sorbus	8	10
Granada	5	7

EXHIBIT III-14

Multivendor Maintenance Market Forecast—Sweden

SK Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	290	310	330	340	345	340	330	1
Dealers and Distributors	120	130	135	142	150	160	170	6
Equipment Vendors	8	10	15	25	40	55	70	48
Total	420	450	480	510	535	555	570	5
Annual Growth (%)		7	7	6	5	4	3	

Note: Numbers are rounded

EXHIBIT III-15

Leading Independent Vendors in Sweden Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	SK Millions	
Nexor/Telub	245	260
3C	85	100
Granada	22	25

EXHIBIT III-16

Multivendor Maintenance Market Forecast—Netherlands

Dfl Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	255	293	330	365	395	420	445	9
Dealers and Distributors	20	22	24	27	29	32	35	10
Equipment Vendors	5	10	20	32	45	58	70	48
Total	280	325	375	425	470	510	550	12
Annual Growth (%)		16	15	13	11	9	8	

Note: Numbers are rounded

EXHIBIT III-17

Leading Independent Vendors in the Netherlands Ranked by 1991 Revenues

1991	1992 Sector Revenues	Forecast Revenues
Company	Dfl Millions	
Getronics/ KH Service	117	136
Granada	30	34
Thijssen	20	22
Servicetec/ Econocom	17	20

EXHIBIT III-18

Multivendor Maintenance Market Forecast—Belgium

BF Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	1,700	1,970	2,240	2,500	2,760	2,920	3,100	9
Dealers and Distributors	300	330	360	400	440	480	550	11
Equipment Vendors	200	230	280	350	450	650	900	31
Total	2,200	2,530	2,880	3,250	3,650	4,050	4,550	12
Annual Growth (%)		15	14	13	12	11	12	

Note: Numbers are rounded

EXHIBIT III-19

Leading Independent Vendors in Belgium Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	BF Millions	
Econocom	500	550
Granada	375	380
Getronics	280	320
Thijssen	130	140

EXHIBIT III-20

Multivendor Maintenance Market Forecast—Spain

	Ptas Millions							
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	11,450	14,500	18,100	22,050	26,050	30,900	37,000	21
Dealers and Distributors	1,100	1,200	1,350	1,550	1,750	2,000	2,300	14
Equipment Vendors	2,000	2,500	3,300	4,400	5,700	7,400	9,200	30
Total	14,550	18,200	22,750	28,000	33,500	40,300	48,500	22
Annual Growth (%)		25	25	23	20	20	20	

Note: Numbers are rounded

EXHIBIT III-21

Leading Independent Vendors in Spain Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	Ptas Millions	
Eltec	3,400	4,300
Sintec	1,600	2,000
Granada	1,400	1,500
Thomainfor	500	620
Getronics	300	350

EXHIBIT III-22

Multivendor Maintenance Market Forecast—Denmark

DK Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	47	53	61	70	79	88	100	14
Dealers and Distributors	12	13	14	15	16	17	17	6
Equipment Vendors	59	64	69	75	80	87	93	8
Total	118	130	144	160	175	192	210	10
Annual Growth (%)		10	11	10	10	10	9	

EXHIBIT III-23

Leading Independent Vendors in Denmark Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	DK Millions	
Nexor/Telub	24	25
Digital	12	13
NCR	5	6

EXHIBIT III-24

Multivendor Maintenance Market Forecast—Norway

NK Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	70	80	95	109	119	134	150	13
Dealers and Distributors	13	15	15	16	18	19	20	8
Equipment Vendors	55	60	64	70	75	80	85	7
Total	138	155	174	195	212	233	255	10
Annual Growth (%)		13	12	11	10	10	9	

EXHIBIT III-25

Leading Independent Vendors in Norway Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	NK Millions	
Nexor/Telub	36	40
Norsk Data	6	8
Granada	1	2

EXHIBIT III-26

Multivendor Maintenance Market Forecast—Finland

FM Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	37	41	45	49	53	59	64	9
Dealers and Distributors	8	9	10	11	12	13	14	9
Equipment Vendors	42	45	48	52	55	58	62	7
Total	87	95	103	112	120	130	140	8
Annual Growth (%)		9	8	8	7	8	9	

Note: Numbers are rounded

EXHIBIT III-27

Leading Independent Vendors in Finland Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	FM Millions	
Nexor/Telub	17	19
Digital	8	9
ICL/Nokia	8	10

EXHIBIT III-28

Multivendor Maintenance Market Forecast—Switzerland

	SF Millions							
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	22	24	25	27	29	31	33	7
Dealers and Distributors	11	12	13	13	14	15	17	7
Equipment Vendors	35	38	42	47	51	55	60	10
Total	68	74	80	87	94	101	110	8
Annual Growth (%)		9	8	9	8	7	9	

EXHIBIT III-29

Leading Independent Vendors in Switzerland, Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	SF Millions	
Sorbus	2.75	3.5
Thomainfor	2.0	2.2
Granada	1.9	2.0

EXHIBIT III-30

Multivendor Maintenance Market Forecast—Austria

	Sch Millions							
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	120	147	177	210	240	272	300	15
Dealers and Distributors	20	23	26	30	35	38	40	12
Equipment Vendors	70	80	87	95	105	115	125	9
Total	210	250	290	335	380	425	465	13
Annual Growth (%)		19	16	16	13	12	11	

Note: Numbers are rounded

EXHIBIT III-31

Leading Independent Vendors in Austria Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	Sch Millions	
Thomainfor	5	6
Sorbus	3	4

EXHIBIT III-32

Multivendor Maintenance Market Forecast—Ireland

IR £ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	5.0	5.4	5.8	6.2	6.6	7.1	7.6	7
Dealers and Distributors	-	-	0.2	0.3	0.4	0.5	0.7	35*
Equipment Vendors	-	0.1	0.1	0.2	0.2	0.3	0.3	25
Total	5.0	5.5	6.1	6.7	7.2	7.9	8.6	9
Annual Growth (%)		10	11	10	7	10	9	

* = CAGR 1993-1997

EXHIBIT III-33

Leading Independent Vendors in Ireland Ranked by 1991 Revenues

	1991 Sector Revenues	1992 Forecast Revenues
Company	IR £ Millions	
CM Ireland	2.3	2.5
Granada	1.5	1.7
DDT	1.0	1.2

EXHIBIT III-34

Multivendor Maintenance Market Forecast—Portugal

ESC Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	600	690	840	925	1,080	1,400	1,860	22
Dealers and Distributors	250	310	390	490	610	760	955	25
Equipment Vendors	-	50	70	85	110	140	185	30
Total	850	1,050	1,300	1,500	1,800	2,300	3,000	23
Annual Growth (%)		24	22	20	20	25	30	

EXHIBIT III-35

Multivendor Maintenance Market Forecast—Greece

Dra Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	-	-	-	-	-	-	-	-
Dealers and Distributors	800	920	1,070	1,240	1,440	1,670	1,900	16
Equipment Vendors	400	480	580	725	920	1,160	1,500	26
Total	1,200	1,400	1,650	1,965	2,360	2,830	3,400	19
Annual Growth (%)		16	18	19	20	20	20	

EXHIBIT III-36

Multivendor Maintenance Market Forecast—Eastern Europe

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	-	-	5	8	15	30	55	82*
Dealers and Distributors	50	56	62	68	80	95	105	13
Equipment Vendors	40	44	48	54	65	85	90	15
Total	90	100	115	130	160	210	250	20
Annual Growth (%)		11	15	13	23	31	19	

* = CAGR 1993-1997

D

Multivendor Market Forecast by Platform

Multivendor maintenance is set to grow at 11% over all platform types in Europe this year. However, growth in the same period across different platform types varies considerably from zero for mainframes to +50% for workstations and servers.

This position is summarised in Exhibit III-37, which shows not only the current market growth in each sector, but also the forward five-year growth to 1997. This table is based upon INPUT's hardware maintenance market model for Europe. This four-layer model is being used to revise INPUT's market sizing and forecasting in 1992.

EXHIBIT III-37

European Multivendor Maintenance Market Platform Sector Growth, 1991-1997

User Expenditure (U.S. $ Billions)						
Platform	1991	Growth 1991-1992 (Percent)	1992	1993	1997	Growth 1992-1997 (Percent)
Mainframe	0.2	0	0.2	0.2	0.2	0
Midrange	0.6	-16	0.5	0.5	0.6	+4
Workstations and Servers	0.1	+50	0.2	0.2	1.0	+17
PCs and LANs	1.5	+20	1.8	2.0	2.6	+8
Total (Rounded)	2.4	+11	2.7	2.9	4.4	+10

Note: Numbers are rounded

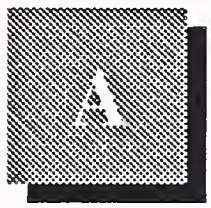
The model's four layers are:

- Mainframes, composed of systems costing typically $1 million or more in a single configuration
- Midrange systems, normally costing more than $100 thousand but less than $1 million similarly
- Workstations and servers, normally costing more than $10 thousand but less than $100 thousand. In the case of multi-seat workstation configurations, the unit of the installed base is taken as the individual "seat."
- Personal computers (PCs) with single processor values of less than $10 thousand. Servers for configurations and networks in this price bracket are counted at this level and not in the workstation/server category.

Proprietary system service contracts reside at the top layers of the market, where growth is zero for mainframes and 4% per annum through to 1997 for midrange platforms. Currently accounting for just over 25% of the multivendor maintenance market, their share will shrink to only 18% by 1997. The opportunities clearly lie in the lower two segments, where client/servers and PC LAN-based networks are expanding fast and starting to carry the mission-critical information for an increasing number of organisations that embrace the philosophy of downsizing their operations from both the business and the IS perspectives.

To capture this expanding portion of the maintenance market, vendors must:

- Have a programme to put in place the correct range of resources, skills, expertise and relationships with complementary vendors, in order to support the offerings marketed.
- Structure these offerings to achieve the correct balance between bought-in and in-house-supplied service elements.
- Target companies that have embraced the single-supplier concept.
- Control customers' perception of their satisfaction levels by rigorously monitoring and policing internal and external quality procedures.



Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit A-1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

For 1992 INPUT has added one delivery mode and defined three new submodes to its Information Services Industry Structure:

- *Equipment Services* has been added as the ninth delivery mode. INPUT has forecasted the equipment maintenance, support and related services market through its Customer Services Programmes for a number of years. Starting in 1992, the equipment services portion of the customer services market will be included in the total information services industry as defined by INPUT. Other portions of this market (such as software support) are already included.

- Two new submodes have been defined in the *Systems Operations* delivery mode—*desktop services* and *network management*. They are defined on pages 5 and 6.

- A fourth submode has been defined within the Professional Services delivery mode—*applications management*. This change reflects a shift in the way some software development and maintenance services are purchased. A complete definition is provided on page 6.

A series of definitions for computer equipment have also been added.

Changes from the 1991 INPUT *Definitions of Terms* are indicated with a ☆.

B

Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are orientated toward the development or use of information systems. Information services typically involve one or more of the following:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)
- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-orientated services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line databases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorised according to what users perceive they are buying.

By focussing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)

- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

3. Delivery Modes

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the nine delivery modes defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three delivery modes represent combinations of these products and services, combined with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section C describes the delivery modes and their structure in more detail.

4. Market Sectors

Market Sectors or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called 'industry-specific' markets.

- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called 'cross-industry' markets.

- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line database market.

Specific market sectors used by INPUT are defined in Section E, below.

5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganisational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organisations—commercial and non-commercial—involved in producing a good or services.

- Electronic commerce and trading communities are addressed in INPUT's EDI and Electronic Commerce Program.

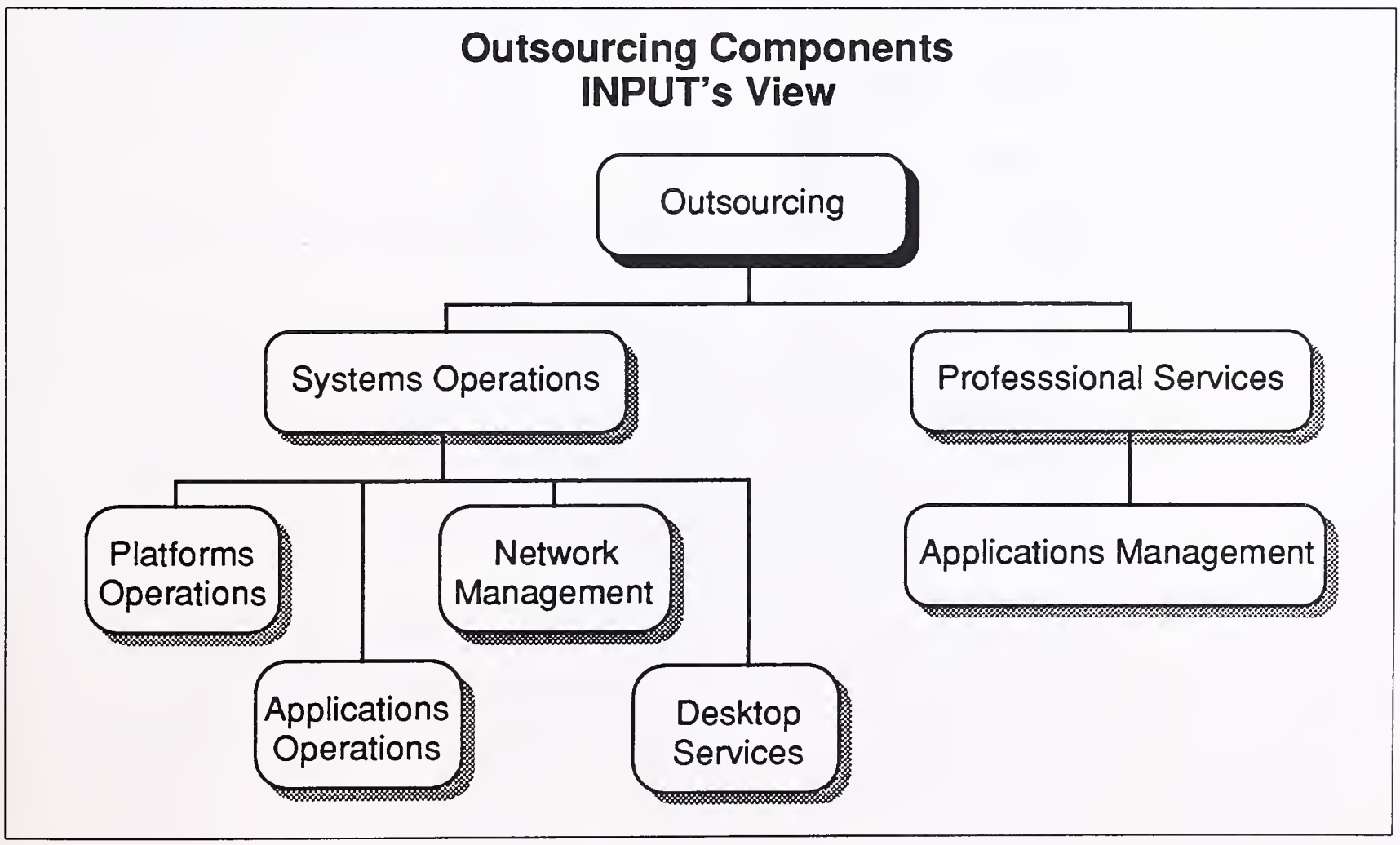
6. Outsourcing

Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit A-1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT A-1



- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.

- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.

☆ *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.

☆ *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance and connectivity between the personal computers and/or intelligent workstations in the client organisation. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

C

Delivery Modes and Submodes

Exhibit A-2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

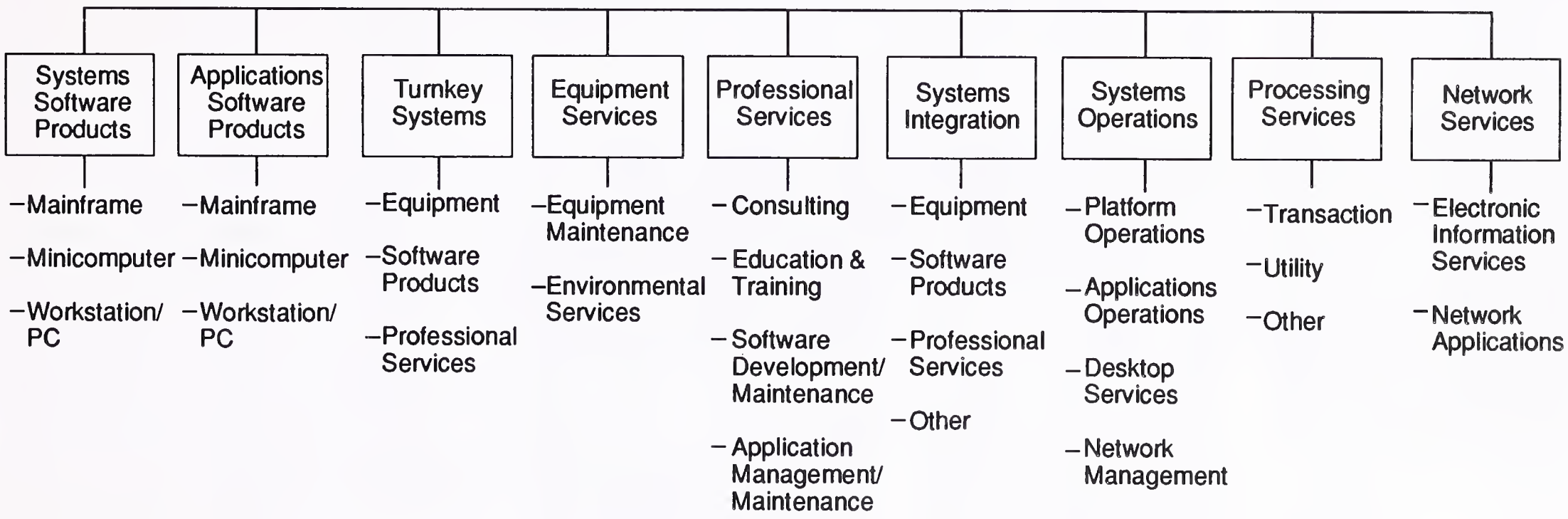
1. Software Products

INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

Expenditures for work performed by organisations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

Information Services Industry Structure—1992

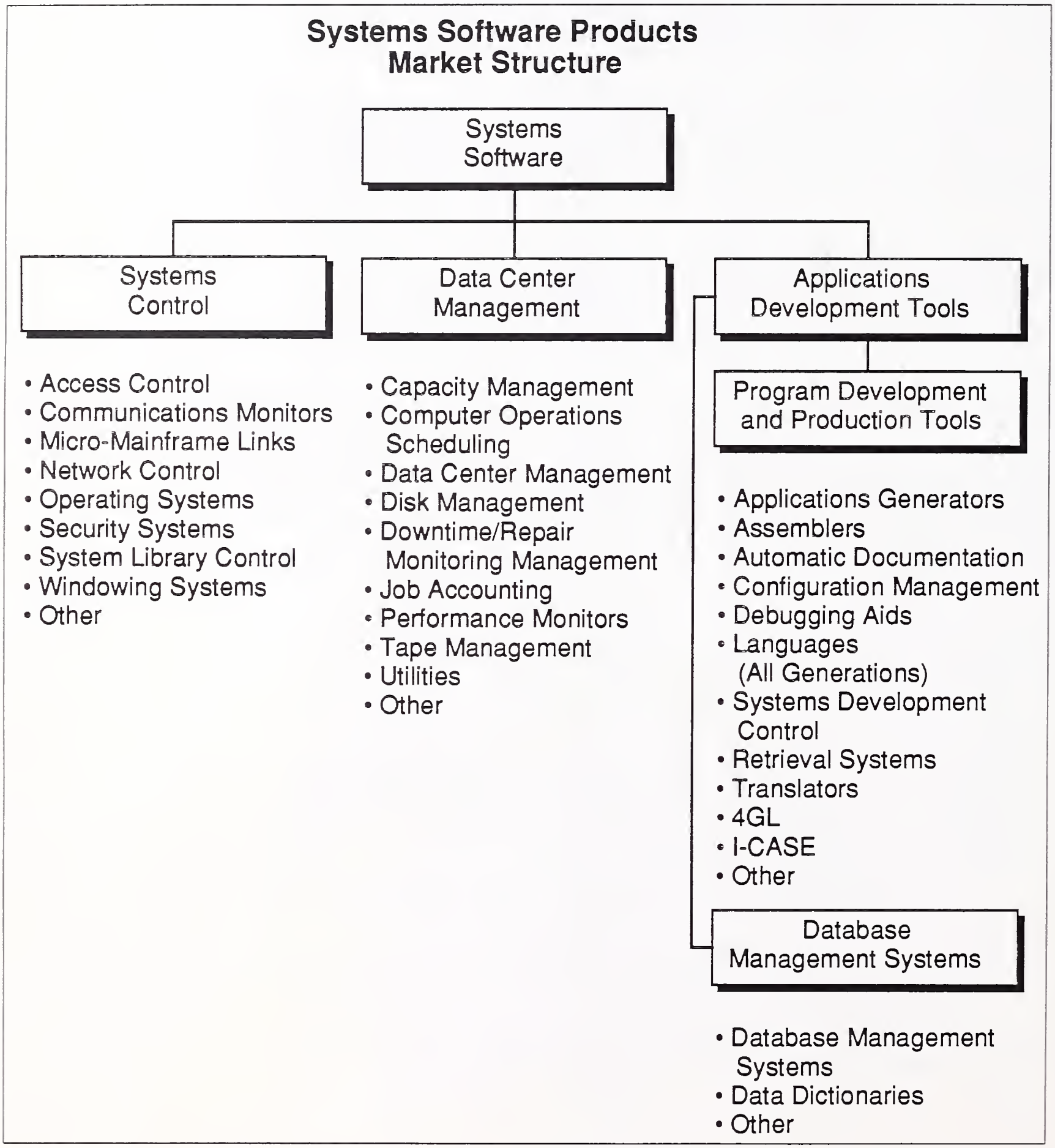


Source: INPUT

a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-orientated or user interface functions. INPUT divides systems software products into three submodes. See Exhibit A-3.

EXHIBIT A-3



- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control and spoolers.

- *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities and capacity management.

- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing and related functions. Included are traditional programming languages, 4GLs, data dictionaries, database management systems, report writers, project control systems, CASE systems and other development productivity aids.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organisation. Examples include accounts payable, order entry, project management and office systems. INPUT categorises applications software products into two groups of market sectors. (See Exhibit A-4.)

- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organisational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

EXHIBIT A-4

Application Products and Turnkey Systems

- Applications Software Products
  - Cross-Industry
    - Office Systems
      - Integrated Office Systems
      - Word Processing
      - Desktop Publishing
      - Image Systems
      - Electronic Publishing
    - Accounting
      - General Ledger
      - Accounts Payable
      - Accounts Receivable
      - Billing/Invoicing
      - Costing
      - Fixed Assets
      - International Accounting
      - Purchasing
      - Taxation
    - Human Resources
      - Human Resources Management
      - Payroll
      - Benefits
    - Education & Training
      - Computer-Based Training
      - Authoring Languages
    - Planning & Analysis
      - Executive Information Systems
      - Financial Modeling and Planning
      - Spreadsheets
      - Project Management
    - Engineering & Scientific
      - Computer-Aided Design and Engineering
      - Structural Analysis
      - Statistics/ Mathematics/ Operations Research
      - Mapping
    - Other Cross-Industry
      - Marketing Management
      - Sales Analysis
  - Industry-Specific
    - Discrete Manufacturing
    - Process Manufacturing
    - Transportation Services
    - Utilities
    - Telecommunications
    - Retail Distribution
    - Wholesale Distribution
    - Banking and Finance
    - Insurance
    - Health Services
    - Education
    - Business and Technical Services
    - Federal Government
    - State and Local Government
    - Miscellaneous Industries
- Turnkey Systems

2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit A-4.)

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilise standard computers and do not include specialised hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

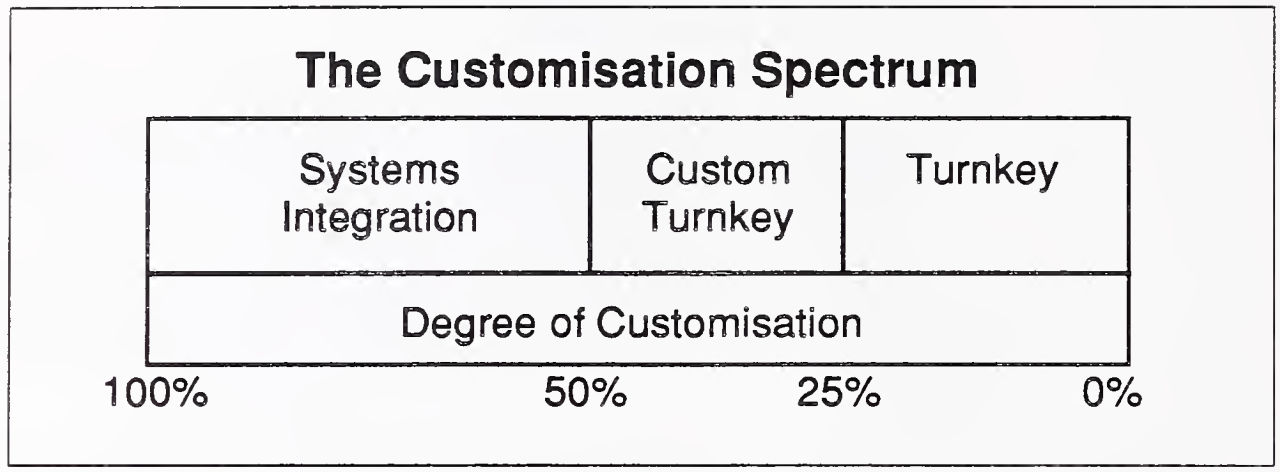
- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services, software support and applications upgrades.

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customise the system or train the user, provided as part of the turnkey system sale

Exhibit A-5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

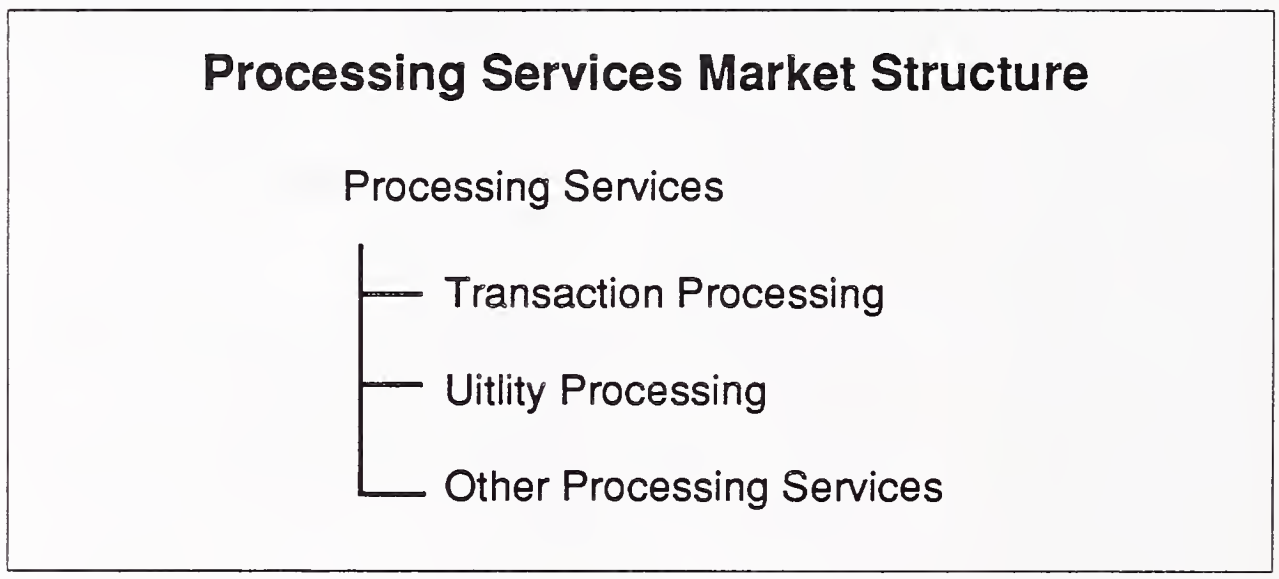
EXHIBIT A-5



3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing and 'other' processing services. See Exhibit A-6.

EXHIBIT A-6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client databases. The application software is typically provided by the vendor.

- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.

- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programmes. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data center operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

☆ *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organisation. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the U.S. federal government market, systems operation services are also defined by equipment ownership with the terms 'COCO' (Contractor-Owned, Contractor-Operated), and 'GOCO' (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- *Software products* - prepackaged applications and systems software products.

- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.

- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

EXHIBIT A-7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Program/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

6. Professional Services

This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit A-8 provides additional detail.

- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.

- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems are not included. General education and training products are included as a cross-industry market sector.

- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

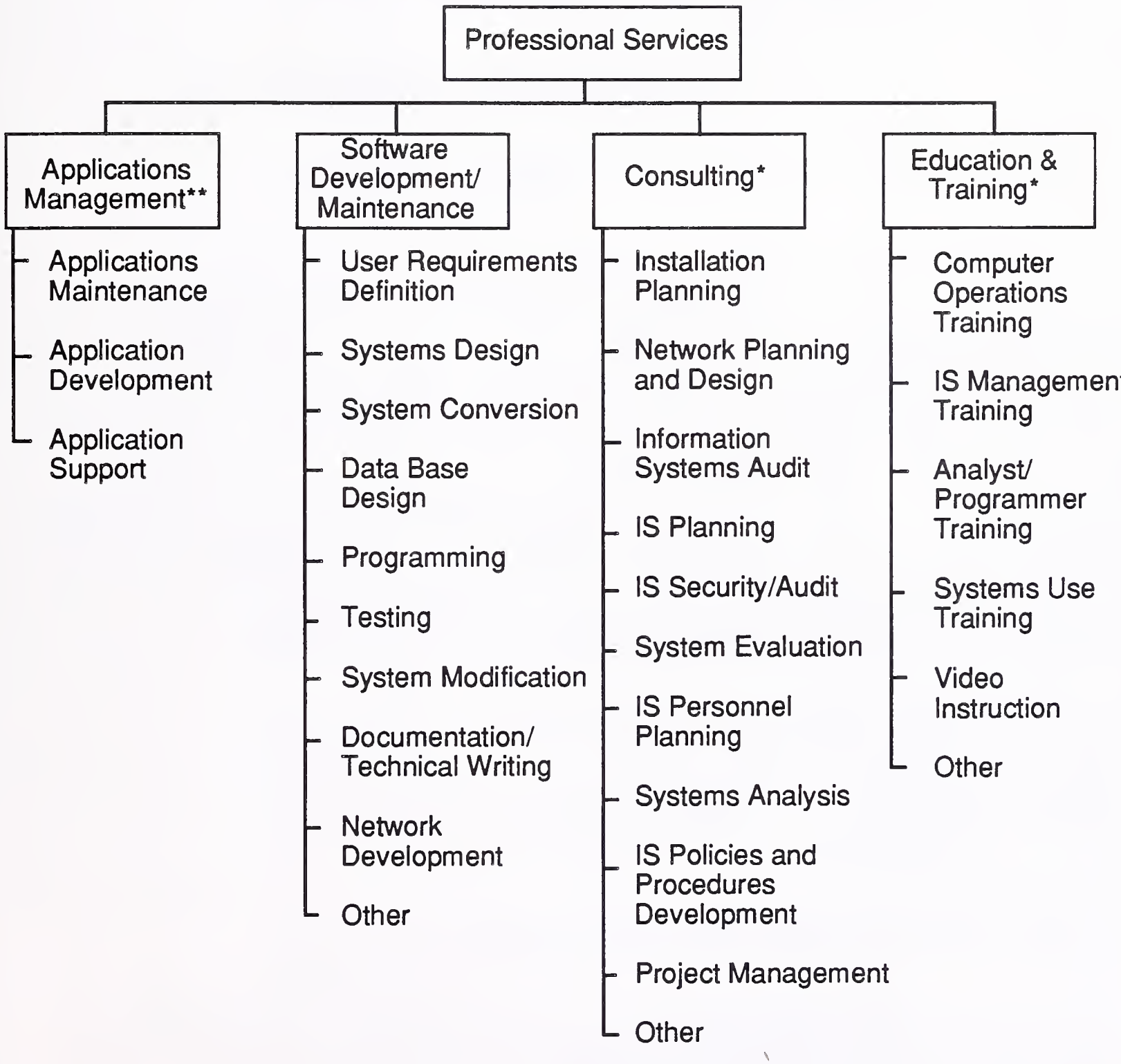
☆ *Applications Management*: The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

These services may be provided in combination or separately from platform systems operations.

EXHIBIT A-8

Professional Services Market Structure



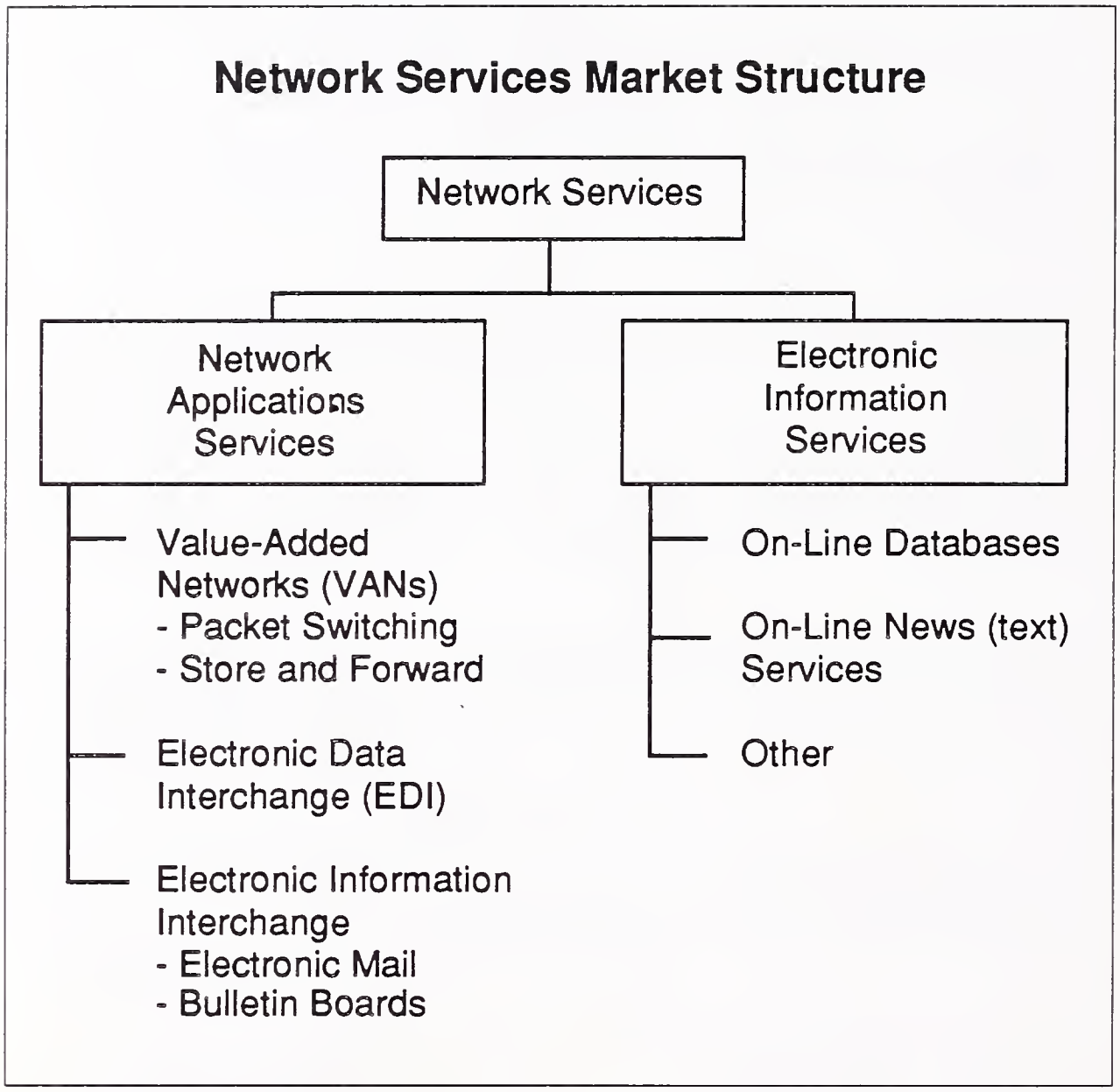
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit A-9.

EXHIBIT A-9



a. Electronic Information Services

Electronic information services are databases that provide specific information via terminal- or computer-based enquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnoses, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the databases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's databases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

The two kinds of electronic information services are:

- *On-line Databases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

b. Network Applications

Value-Added Network Services (VAN Services) - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialised VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

Electronic Data Interchange (EDI) - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

☆ The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.

☆ *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.

☆ *Environmental Services* - Composed of equipment and data center related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

D
Computer Equipment

☆ These definitions have been included to provide the basis for market segmentation in the software products markets.

☆ *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

☆ *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals

☆ *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters

☆ *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

☆ *Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control

☆ *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories

☆ *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

☆ *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than $5,000.

☆ *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as database access, file storage and back-up, remote communications and peripheral support. These products usually cost from $5,000 to $15,000.

☆ *Minicomputer or midsize computers* - Minicomputers are generally priced from $15,000 to $350,000. Many of the emerging client/server computers are in this category.

☆ *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than $350,000.

E

Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit A-10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit A-9 and section E-3 (Delivery Mode Reporting by Sector).

Note: SIC code 88 is Personal Households. INPUT does not currently analyse or forecast information services in this market sector.

EXHIBIT A-10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetalic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx	Building materials
	53xx	General merchandise stores
	54xx	Food stores
	55xx	Automotive dealers, gas stations
	56xx	Apparel and accessory stores
	57xx	Home furniture, furnishings and accessory stores
	58xx	Eating and drinking places
	59xx	Miscellaneous retail
Wholesale Distribution	50xx	Wholesale trade - durable goods
	51xx	Wholesale trade - nondurable goods
Banking and Finance	60xx	Depositary institutions
	61xx	Nondepositary institutions
	62xx	Security and commodity brokers, dealers, exchanges and services
	67xx	Holding and other investment offices
Insurance	63xx	Insurance carriers
	64xx	Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

- INPUT only includes the turnkey systems, applications software products and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
- Financial management
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation

- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following:

- Integrated office systems (IOS)
- Word processing
- Desktop publishing
- Electronic publishing
- Image systems

- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.

- Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages and electronic form programs.

- The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.

- Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS

- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

Other encompasses marketing/sales and electronic publishing application solutions.

- Sales and marketing includes:

  - Sales analysis
  - Marketing management
  - Demographic market planning models

3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit A-11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.

- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.

- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.

- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

EXHIBIT A-11

Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction Utility Other	X	X	 X X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform Applications	X X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications Electronic Information Services	X X		 X
Systems Software Products				X
Equipment Services				X

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

  Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, mini-computer and workstation/PC.

- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

F

Vendor Revenue and User Expenditure Conversion

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the valued added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

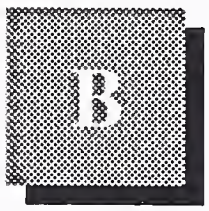
To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

Exhibit A-12 summarises the net effect of the various ratios used by INPUT to convert vendor revenues to user expenditure (market size) figures for each delivery mode.

EXHIBIT A-12

Vendor Revenue to User Expenditure Conversion

Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	0.95
Systems Integration	0.95
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95
Equipment Services	0.99



Economic Assumptions

There follow some notes on the methodology INPUT uses in making forecasts and judging how reasonable they are.

INPUT reports are based principally on three strands of research activity conducted throughout the year:

- A vendor research programme with more than 300 interviews with prominent software and services vendors across Europe. This research assesses these vendors' attributable revenues in each country by delivery mode and, where possible, by industry sector. INPUT consultants use their own judgment in many cases to categorise revenues into subsectors. In particular, INPUT excludes revenues considered captive, such as those from a vendor's parent company.

- Several hundred vendor and user interviews across all European market sectors to determine trends and opinions. These interviews are part of the research that INPUT carries out in specific sectors of the software and services market. In 1990, for example, INPUT produced reports on over 20 different software and services market sectors.

- Additionally, INPUT maintains an extensive library and database of information relating to the software and services industry. This covers, for example, INPUT's customer services programme data: results of INPUT's research into the hardware maintenance market, which includes its diversification into the software and services market.

All the forecasts from these activities are produced in local currency for each country, then consolidated with common economic and exchange rate data to produce a top-level forecast. This is done for software and services in each country and in Europe as a whole. At each stage it is examined for reasonableness and consistency and if necessary revisited. For example, INPUT satisfactorily tested the question: Will predicted user budgets for information systems support the predicted growth rates in software and services?

The forecasts also benefit from assignments for and feedback from INPUT clients, who include over 100 of the leading vendors of software and services around the world. For example, INPUT supplied an economic model to a market-leading client on the potential effect of rising oil prices on forecast software and services growth rates. In summary, this showed that falling real growth was largely counterbalanced by increases in inflation, resulting in continued high dollar growth forecasts for the market.

In order to consolidate INPUT's forecasts and vendor data into a consistent set of European analyses each year, it is essential to use a standard set of economic factors. The following pages show the inflation and exchange rates in use for 1992 studies.

A

European Exchange Rates

The following table, Exhibit B-1, shows the standard exchange rates used throughout the 1992 programme to consolidate country market data for overall Western European forecasts and vendor market shares.

EXHIBIT B-1

U.S. Dollar and ECU Exchange Rates—1992

Country	Currency	U.S. Dollar	ECU
France	FF	5.18	6.96
Germany	DM	1.52	2.04
United Kingdom	£	0.532	0.715
Italy	Lira	1,150.0	1,544.0
Sweden	Sek	5.54	7.45
Denmark	DK	5.89	7.93
Norway	NK	5.98	8.03
Finland	FM	4.15	5.51
Netherlands	Dfl	1.71	2.29
Belgium	BF	31.26	41.94
Switzerland	SF	1.35	1.81
Austria	Sch	10.63	14.33
Spain	Ptas	96.2	129.6
Portugal	Esc	134.9	181.0
Greece	Dra	174.0	234.8
Ireland	IR£	0.57	0.765
	$	1.0	1.34

Source: *Financial Times*, 30 December 1991

Exhibit B-2 shows the standard exchange rates used throughout the 1991 programme to consolidate country market data for overall Western European forecasts and vendor market shares.

EXHIBIT B-2

U.S. Dollar and ECU Exchange Rates—1991

Country	Currency	U.S. Dollar Exchange Rate	ECU Exchange Rate
France	FF	5.65	7.74
Germany	DM	1.68	2.30
United Kingdom	£	0.515	0.704
Italy	Lira	1,233.0	1,689.0
Sweden	Sek	5.61	7.69
Denmark	DK	6.39	8.75
Norway	NK	6.49	8.89
Finland	FM	3.96	5.43
Netherlands	Dfl	1.69	2.32
Belgium	BF	34.60	47.40
Switzerland	SF	1.27	1.74
Austria	Sch	11.80	16.17
Spain	Ptas	95.0	130.12
Portugal	Esc	132.5	182.0
Greece	Dra	153.4	210.7
Ireland	IR£	0.51	0.771
	$	1.0	1.37

Source: Barclays Bank (Q4 1990)

B

European Inflation Rates

Exhibit B-3 shows the average five-year inflation assumptions for each reported country and the changes from those used in reports produced in the previous year. All INPUT forecasts include the effects of inflation as well as natural market growth rates. For consistency, the same inflation rates are used throughout all the different market sector research and analyses during a calendar year, unless specified otherwise.

EXHIBIT B-3

Inflation Assumptions—1991 and 1992

Country	Assumption 1991-1996	Assumption 1992-1997	Change
France	3.0	2.7	-0.3
Germany	2.7	3.9	+1.2
United Kingdom	4.8	3.7	-1.1
Italy	4.4	5.2	+0.8
Sweden	6.3	4.0	-2.3
Denmark	2.7	2.4	-0.3
Norway	4.9	3.4	-1.5
Finland	5.0	1.4	-3.6
Netherlands	2.4	3.3	+0.9
Belgium	3.3	3.2	-0.1
Switzerland	3.3	3.5	+0.2
Austria	2.6	3.2	+0.6
Spain	4.7	5.0	+0.3
Portugal	8.0	12.5	+4.5
Greece	12.0	11.0	-1.0
Ireland	3.0	3.0	0.0
European Average	4.0	4.2	+0.2

Source: OECD Forecasts, Q4 1991

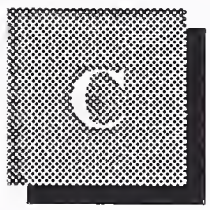
Exhibit B-4 shows the inflation assumptions for both the 1990 and 1991 research programmes.

EXHIBIT B-4

Inflation Assumptions—1990 and 1991

Country	Assumption 1990-1995	Assumption 1991-1996	Change
France	4.5	3.0	-1.5
Germany	4.0	2.7	-1.3
United Kingdom	7.0	4.8	-2.2
Italy	7.0	4.4	-2.6
Sweden	7.0	6.3	-0.7
Denmark	5.0	2.7	-2.3
Norway	5.0	4.9	-0.1
Finland	6.0	5.0	-1.0
Netherlands	3.0	2.4	-0.6
Belgium	4.0	3.3	-0.7
Switzerland	5.0	3.3	-1.7
Austria	4.0	2.6	-1.4
Spain	6.5	4.7	-1.8
Portugal	-	8.0	N/A
Greece	-	12.0	N/A
Ireland	-	3.0	N/A
European Average	5.5	4.0	-1.5

Source: OECD 1991 Forecast, IMF 1989



Vendor Questionnaire and Company Profile

Name of Company:

Address:

Tel:
Fax:

Company Information

Number of service centres:
Number of employees in maintenance:

Number of engineers:
- Field engineers:
- Bench engineers:

Number of sales personnel:
Total number of employees:

Revenues derived from maintenance
- 1991 Revenues:
- 1992 Forecast:

Total revenues
- 1991 Revenues:
- 1992 Forecast:

Types of equipment maintained (please give manufacturer/model and percentages of revenues earned on each).

	%
Mainframes:	____
Minicomputers:	____
Technical Workstations:	____
Business PCs:	____
Peripherals:	____
Other Equipment:	____

What percentage of your revenues are gained from servicing open systems? _____%

What software systems do you have expertise in? (Please give names of products/environments, e.g., AIX, Ultrix, Oracle.)

_____

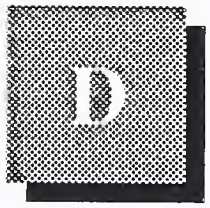
_____

Which industry sectors do you specialise in? (E.g., Retail, Government)

_____

Other issues

_____



Market Forecasts

The following tables show the market forecasts for each European country as measured in U.S. dollars for comparative purposes. There is one table for each of the 16 European countries and one table for Europe as a whole.

EXHIBIT D-1

Multivendor Maintenance Market Forecast—France

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	402	430	456	480	504	525	535	4
Dealers and Distributors	42	40	50	56	62	68	73	13
Equipment Vendors	25	29	35	42	52	62	73	20
Total	470	500	541	579	618	654	680	6
Annual Growth (%)		6	8	7	6	5	4	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-2

Multivendor Maintenance Market Forecast—Germany

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	135	143	155	166	190	210	230	11
Dealers and Distributors	105	118	132	151	164	178	200	11
Equipment Vendors	6	8	9	11	15	22	32	33
Total	245	270	296	329	368	410	460	11
Annual Growth (%)		10	10	11	12	12	12	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-3

Multivendor Maintenance Market Forecast—United Kingdom

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	580	635	665	690	720	780	835	6
Dealers and Distributors	50	53	55	60	70	75	85	10
Equipment Vendors	140	155	170	190	205	235	265	11
Total	770	840	890	940	1,000	1,100	1,180	7
Annual Growth (%)		9	7	6	6	8	9	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-4

Multivendor Maintenance Market Forecast—Italy

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	144	160	174	185	195	205	215	6
Dealers and Distributors	57	65	78	91	105	110	120	13
Equipment Vendors	9	10	13	19	25	40	55	38
Total	210	240	265	295	325	355	390	11
Annual Growth (%)		13	12	11	10	10	10	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-5

Multivendor Maintenance Market Forecast—Sweden

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	53	56	60	61	62	61	60	1
Dealers and Distributors	22	23	24	26	27	29	31	6
Equipment Vendors	1	2	3	5	7	10	13	48
Total	76	81	87	92	96	100	105	5
Annual Growth (%)		7	7	6	5	4	3	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-6

Multivendor Maintenance Market Forecast—Netherlands

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	149	171	193	213	231	245	260	9
Dealers and Distributors	12	13	14	16	17	19	20	10
Equipment Vendors	3	6	12	19	26	35	41	48
Total	164	190	220	250	275	300	320	12
Annual Growth (%)		16	15	13	11	9	8	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-7

Multivendor Maintenance Market Forecast—Belgium

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	54	63	72	80	88	95	99	9
Dealers and Distributors	10	11	12	13	14	15	18	11
Equipment Vendors	6	7	9	11	14	20	29	31
Total	70	80	92	104	117	130	145	12
Annual Growth (%)		15	14	13	12	11	12	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-8

Multivendor Maintenance Market Forecast—Spain

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	119	150	188	229	272	321	385	21
Dealers and Distributors	11	12	14	16	18	21	24	14
Equipment Vendors	20	26	34	45	60	77	95	30
Total	150	190	235	290	350	420	505	22
Annual Growth (%)		25	25	23	20	20	20	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-9

Multivendor Maintenance Market Forecast—Denmark

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	8	9	10	12	13	15	17	14
Dealers and Distributors	2	2	2	3	3	3	3	6
Equipment Vendors	10	11	12	13	14	15	16	8
Total	20	22	24	27	30	32	35	10
Annual Growth (%)		10	11	10	10	10	9	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-10

Multivendor Maintenance Market Forecast—Norway

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	12	13	16	18	20	23	25	13
Dealers and Distributors	2	2	3	3	3	3	3	8
Equipment Vendors	9	10	11	12	13	13	14	7
Total	23	26	29	33	35	39	43	10
Annual Growth (%)		13	12	11	10	10	10	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-11

Multivendor Maintenance Market Forecast—Finland

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	9	10	11	12	13	14	16	9
Dealers and Distributors	2	2	2	3	3	3	3	9
Equipment Vendors	10	11	12	13	13	14	15	7
Total	21	23	25	27	29	31	34	8
Annual Growth (%)		9	8	8	7	8	9	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-12

Multivendor Maintenance Market Forecast—Switzerland

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	17	18	19	20	21	23	24	7
Dealers and Distributors	8	9	10	10	11	11	13	7
Equipment Vendors	25	28	31	35	38	41	44	10
Total	50	55	60	65	70	75	81	8
Annual Growth (%)		9	8	9	8	7	9	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-13

Multivendor Maintenance Market Forecast—Austria

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	11	14	17	20	23	25	28	15
Dealers and Distributors	2	2	2	3	3	3	4	12
Equipment Vendors	7	8	8	9	10	11	12	9
Total	20	24	27	32	36	40	44	13
Annual Growth (%)		19	16	16	13	12	11	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-14

Multivendor Maintenance Market Forecast—Ireland

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	8.8	9.5	10.2	10.9	11.6	12.5	13.3	7
Dealers and Distributors	-	-	0.4	0.5	0.7	0.9	1.2	35*
Equipment Vendors	-	0.2	0.2	0.3	0.4	0.4	0.5	25
Total	8.8	9.7	10.8	11.7	12.7	13.8	15.0	9
Annual Growth (%)		10	11	10	7	10	9	

* = CAGR 1993-1997
Note: Numbers are rounded after dollar conversion

EXHIBIT D-15

Multivendor Maintenance Market Forecast—Portugal

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	4	5	6	7	8	10	14	22
Dealers and Distributors	2	2	3	4	5	6	7	25
Equipment Vendors	-	0.4	0.5	0.6	0.8	1.0	1.4	30
Total	6	8	10	11	13	17	22	23
Annual Growth (%)		24	22	20	20	25	30	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-16

Multivendor Maintenance Market Forecast—Greece

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	-	-	-	-	-	-	-	-
Dealers and Distributors	5	5	6	7	8	10	11	16
Equipment Vendors	2	3	3	4	5	7	9	26
Total	7	8	9	11	14	16	20	19
Annual Growth (%)		16	18	19	20	20	20	

Note: Numbers are rounded after dollar conversion

EXHIBIT D-17

Multivendor Maintenance Market Forecast—Eastern Europe

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	-	-	5	8	15	30	55	82*
Dealers and Distributors	50	56	62	68	80	95	105	13
Equipment Vendors	40	44	48	54	65	85	90	15
Total	90	100	115	130	160	210	250	20
Annual Growth (%)		11	15	13	23	31	19	

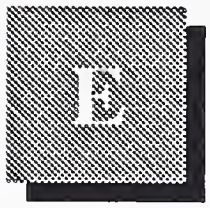
* = CAGR 1993-1997
Note: Numbers are rounded after dollar conversion

EXHIBIT D-18

Multivendor Maintenance Market Forecast—Europe

$ Millions								
	1991	1992	1993	1994	1995	1996	1997	CAGR 1992-1997 (Percent)
Independent Maintenance Vendors	1,705	1,900	2,060	2,215	2,390	2,600	2,810	8
Dealers and Distributors	380	415	470	530	600	655	720	12
Equipment Vendors	315	355	410	485	560	685	820	18
Total	2,400	2,670	2,940	3,230	3,550	3,940	4,350	10
Annual Growth (%)		12	11	10	10	11	10	

Note: Numbers are rounded after dollar conversion



Multivendor Maintenance Market Forecast Reconciliation

EXHIBIT E-1

**Multivendor Maintenance*
Market Forecast Reconciliation**

Country	1991 Estimate of 1991	1992 Estimate of 1991	CAGR in 1991 1991-1996 (Percent)	CAGR in 1992 1992-1997 (Percent)
France	2,430 M FF	2,430 M FF	14	6
Germany	375 M DM	375 M DM	14	11
United Kingdom	410 M £	410 M £	13	7
Italy	240 B LIRA	240 B LIRA	18	11
Sweden	420 M SK	420 M SK	9	5
Netherlands	280 M Dfl	280 M Dfl	15	12
Belgium	2,200 M BF	2,200 M BF	17	12
Spain	14,500 M Ptas	14,500 M Ptas	30	22
Rest of Europe+	160 M $	245 M $	13	13
Total	2,260 M $	2,400 M $	15	10

*Includes the same expenditures as were classified in the total independent maintenance sector in the 1991 report.

+Redefined in 1992 to include Eastern Europe.

The $140 million difference between the 1991 and the 1992 measurements of the 1991 market is accounted for partly by the inclusion of Eastern Europe ($85 million) and partly by changes in currency conversion factors ($55 million).

Report Quality Evaluation

To our clients:
To ensure that the highest standards of report quality are maintained, INPUT would appreciate your assessment of this report. Please take a moment to provide your evaluation of the usefulness and quality of this study. When complete, simply fold, staple, and drop in the post.

Thank You.

1. Report title: ***European Multivendor Maintenance Market, 1992-1997*** (CEIM2)

2. Please indicate your reason for reading this report:
   - ☐ Required reading
   - ☐ Area of high interest
   - ☐ Area of general interest
   - ☐ New product development
   - ☐ Business/market planning
   - ☐ Product planning
   - ☐ Future purchase decision
   - ☐ Systems planning
   - ☐ Other _____

3. Please indicate extent report used and overall usefulness:

	Extent		Usefulness (1=Low, 5=High)				
	Read	Skimmed	1	2	3	4	5
Executive Overview	☐	☐	☐	☐	☐	☐	☐
Complete report	☐	☐	☐	☐	☐	☐	☐
Part of report (_____ %)	☐	☐	☐	☐	☐	☐	☐

4. How useful were:

Data presented	☐	☐	☐	☐	☐
Analyses	☐	☐	☐	☐	☐
Recommendations	☐	☐	☐	☐	☐

5. How useful was the report in these areas:

Alert you to new opportunities or approaches	☐	☐	☐	☐	☐
Cover new areas not covered elsewhere	☐	☐	☐	☐	☐
Confirm existing ideas	☐	☐	☐	☐	☐
Meet expectations	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐

6. Which topics in the report were the most useful? Why? _____

_____

7. In what ways could the report have been improved? _____

_____

8. Other comments or suggestions: _____

_____

_____
Name Title

_____
Department

_____
Company

_____
Address

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Country

_____ _____
Telephone Date completed

Thank you for your time and cooperation.

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